

TECHNICAL MANUAL

**OPERATOR'S, ORGANIZATIONAL, DIRECT SUPPORT, AND
GENERAL SUPPORT MAINTENANCE MANUAL**

FOR

RADIO TERMINAL SETS AN/TRC-117(V)1

AND

AN/TRC-117(V)2

(NSN 5820-00-167-7936)

This copy is a reprint which includes current
pages from Changes 1 through 3.

HEADQUARTERS, DEPARTMENT OF THE ARMY

6 JUNE 1980

WARNING

HIGH VOLTAGE

is used in this equipment.

DEATH ON CONTACT

**MAY RESULT IF SAFETY PRECAUTIONS
ARE NOT OBSERVED**

Maintenance adjustments of this equipment are made with power applied: Be careful when working near the interior of the equipment or near the ac power distribution wiring.

WARNING

VENTILATION IS ESSENTIAL

To prevent asphyxiation, ventilate the AN/TRC-117(V) at all times when it is occupied.

CHANGE }
No. 3 }

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, DC, 30 June 1983

**OPERATOR'S, ORGANIZATIONAL, DIRECT SUPPORT,
AND GENERAL SUPPORT MAINTENANCE MANUAL
RADIO TERMINAL SETS AN/TRC-117(V)1 AND AN/TRC-117(V)2
(NSN 5820-00-167-7936)**

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| 2-13 and 2-14 | 2-13 and 2-14 |
| 2-51 and 2-52 | 2-51 and 2-52 |
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| Figure FO-4 | Figure FO-4 |
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**Operator's Organizational, Direct Support,
And General Support Maintenance Manual
RADIO TERMINAL SETS AN/TRC-117(V)1 AND AN/TRC-117(V)2
(NSN 5820-00-167-7936)**

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No. 1

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, DC, 21 December 1981

**OPERATOR'S, ORGANIZATIONAL, DIRECT SUPPORT,
AND GENERAL SUPPORT MAINTENANCE MANUAL**

**RADIO TERMINAL SETS AN/TRC-117(V)1 AND AN/TRC-117(V)2
(NSN 5820-00-167-7936)**

TM 11-5895-366-14-2, 6 June 1980, is changed as follows:

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| 2-1 thru 2-6 | 2-1 and 2-6 |
| 2-19 and 2-20 | 2-19 and 2-20 |
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| 2-29 thru 2-32 | 2-29 thru 2-32 |
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| 2-55 and 2-56 | 2-55 and 2-56 |
| 5-3 and 5-4 | 5-3 and 5-4 |
| 7-3 and 7-4 | 7-3 and 7-4 |
| A-1, A-2, and A-3 | A-1, A-2, and A-3 |
| B-13 and B-14 | B-13 and B-14 |
| Figure 2-1 | Figure 2-1 |
| Figure FO-1 | Figure FO-1 |
| Figure FO-6 | Figure FO-6 |

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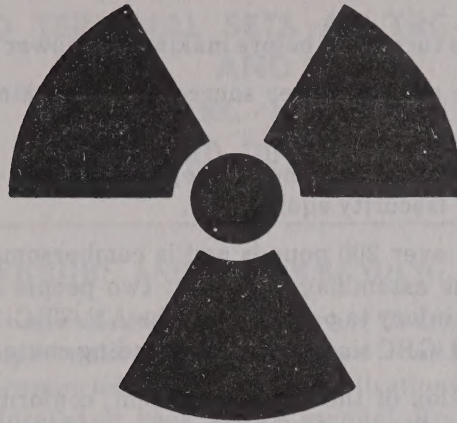
By Order of the Secretary of the Army:

Official:

ROBERT M. JOYCE
Brigadier General, United States Army
The Adjutant General

E. C. MEYER
General, United States Army
Chief of Staff

DANGER



STD-RW-1

| | | | |
|-------------------------|-------|----------|------------------|
| Meter, Arbitrary Scale | Ra226 | 1.0uCi | 6625-00-226-5679 |
| | | | 6625-00-226-5681 |
| Electron Tube OB2WA | | | 5960-00-624-4718 |
| RCA | Ni63 | 0.01uCi | |
| Raytheon | Kr85 | 0.04uCi | |
| CBS Hytron | Ni63 | 0.05uCi | |
| Jack & Heintz | Ra226 | 6.0uCi | |
| Tung-Sol (Chatham) | Ra226 | 0.005uCi | |
| English Elec. Valve Co. | UO2 | 0.10uCi | |
| Electron Tube 5670 | Th232 | 0.07uCi | 5960-00-188-6584 |

Radiation Hazard Information: The following radiation hazard information must be read and understood by all personnel before operating or repairing Radio Terminal Set AN/TRC-117(V). Hazardous radioactive materials are present in the above listed components of the PP-2054/GRC, R-1331(P)/GRC, and AM-1956/GRC-50A(V).

The components are potentially hazardous when broken. See qualified medical personnel and the local Radiological Protection Officer (RPO) immediately if you are exposed to or cut by broken components. First aid instructions are contained in TB 43-0122 and AR 755-15.

NEVER place radioactive components in your pocket. Use extreme care **NOT** to break radioactive components while handling them.

NEVER remove radioactive components from cartons until you are ready to use them.

If any of these components are broken, notify the local RPO immediately. The RPO will survey the immediate area for radiological contamination and will supervise the removal of broken components. The above listed radioactive components *will not* be repaired or disassembled. Disposal of broken, unserviceable, or unwanted radioactive components will be accomplished in accordance with the instructions in AR 755-15.

WARNINGS

To avoid injury to personnel, or damage to equipment, only personnel engaged in the actual loading operation should be permitted near the truck, lifting device, and assemblage. To eliminate confusion, all instructions must come from one loading crew supervisor.

All personnel must remain clear of the truck while the assemblage is being lowered onto the truck.

The generator set should be turned off before making any power connections.

Turn off or disconnect the central power source before making any corrections.

To prevent a TEMPEST hazard, disconnect Telephone Set TA-312/PT when installing the TSEC/KG-27 (security equipment).

Each AB-577/GRC weighs over 200 pounds and is cumbersome to handle in the limited space inside the assemblage. At least two people should handle each AB-577/GRC to avoid injury to personnel. If the AN/TRC-117(*) is truck mounted, slide each AB-577/GRC slowly down the loading chute.

During assembly and erection of the antenna system, conform to all safety requirements of TB SIG 291. Injury of DEATH can result from failure to comply with all safety regulations.

Be sure that the CV-1548/G POWER switch is OFF. Voltage of more than 121V ac will damage the equipment, or possibly cause an explosion resulting in injury to personnel.

To prevent TEMPEST hazard, disconnect the phone-intercom cable from the signal entrance box if in use. Also, remove the headset(s) from the TALK-MONITOR receptacles when not in use.

To prevent a TEMPEST hazard, remove headset plug from jack when not in use.

WARNING

Adequate ventilation should be provided while using TRICHLOROTRIFLUOROETHANE. Prolonged breathing of vapor should be avoided. The solvent should not be used near heat or open flame; the products of decomposition are toxic and irritating. Since TRICHLOROTRIFLUOROETHANE dissolves natural oils, prolonged contact with skin should be avoided. When necessary, use gloves which the solvent cannot penetrate. If the solvent is taken internally, consult a physician immediately.

WARNING

To be usable for cleaning, the compressed air source must limit the nozzle pressure to no more than 29 pounds per square inch gauge (PSIG). Goggles must be worn at all times while cleaning with compressed air.

Do not operate the TD-204/U CABLE POWER switch to ON at either end of the cable link unless requested by the lineperson. If the CABLE POWER switch is operated on ON, voltages as high as 1,000 volts may be present in the transmission cable.

Before performing any POWER DISTRIBUTION PANEL repairs, disconnect the power cable from the POWER 115V AC IN receptacle in the POWER and SIGNAL ENTRANCE BOX.

TECHNICAL MANUAL

No. 11-5895-366-14-2

HEADQUARTERS,
DEPARTMENT OF THE ARMY
WASHINGTON, DC, 6 June 1980OPERATOR'S, ORGANIZATIONAL, DIRECT SUPPORT, AND
GENERAL SUPPORT MAINTENANCE MANUALRADIO TERMINAL SETS AN/TRC-117(V)1
AND
AN/TRC-117(V)2
(NSN 5820-00-167-7936)

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this manual. If you find any mistakes or if you know of a way to improve the procedures, please let us know. Mail your letter, DA Form 2028 (Recommended Changes to Publications and Blank Forms), or DA Form 2028-2 located in back of this manual direct to Commander, US Army Communications-Electronics Command and Fort Monmouth, ATTN: DRSEL-ME-MP, Fort Monmouth, NJ 07703.

In either case, a reply will be furnished direct to you.

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Figure 1-1. Radio Terminal Set AN/TRC-117(*), rear curbside view.

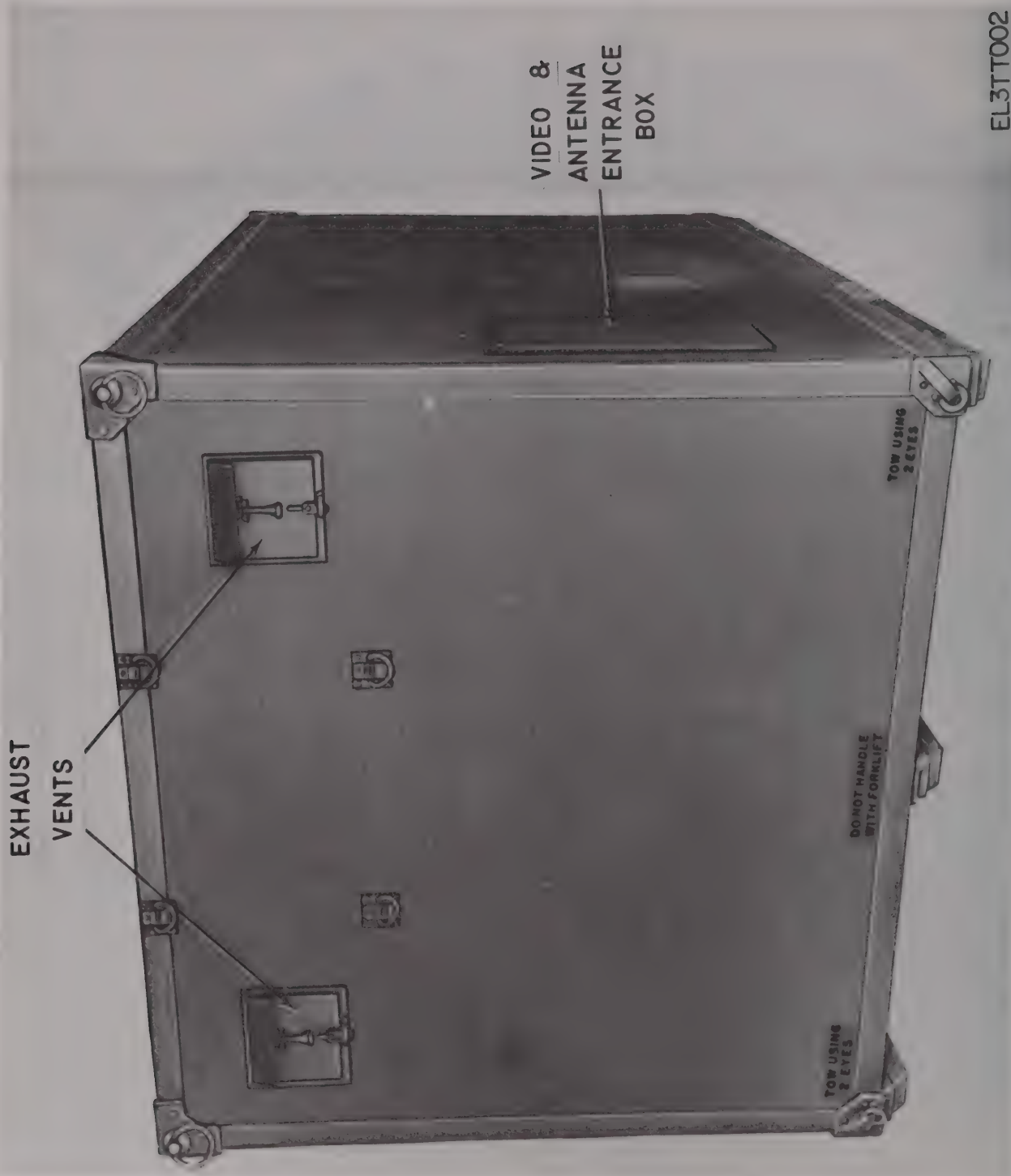


Figure 1-2. Radio Terminal Set AN/TRC-117(*), front roadside view.

CHAPTER 1

INTRODUCTION

Section 1. GENERAL

1-1. Scope

a. This manual describes Radio Terminal Sets AN/TRC-117(V)1 and AN/TRC-117(V)2 (fig. 1-1 and 1-2). It includes instructions for installing, operating, and maintaining the assemblages at the operator, organizational, direct support, and general support categories.

b. Throughout the manual, where appropriate, references are made to other publications which cover the installation, operation, and maintenance of those equipments that are installed in the assemblages. A complete list of applicable reference publications is provided in appendix A. The maintenance allocation chart appears in appendix D.

c. Appendixes B through E are current as of August 1981.

d. Throughout this manual, AN/TRC-117(V)(*) indicates both AN/TRC-117(V)1 and the AN/TRC-117(V)2 unless otherwise indicated.

1-2. Consolidated Index of Army Publications and Blank Forms.

Refer to the latest issue of DA Pam 310-1 to determine whether there are new editions, changes or additional publications pertaining to the equipment.

1-3. Maintenance Forms, Records, and Reports

a. *Reports of Maintenance and Unsatisfactory Equipment.* Department of the Army forms and procedures used for equipment maintenance will be those prescribed by TM 38-750, The Army Maintenance Management System (TAMMS).

b. *Report of Packaging and Handling Deficiencies.* Fill out and forward SF 364 (Report of Discrepancy (ROD)) as prescribed in AR 735-11-2/DLAR 4140.55/NAVMATINST 4355.73/AFR 400.54/MCO 4430.3E.

c. *Discrepancy in Shipment Report (DISREP) (SF 361.)* Fill out and forward Discrepancy in Shipment Report (DISREP) (SF 361) as prescribed in

AR 55-38/NAVSUPINST 4610.33B/AFR 75-18/MCO P4610.19C/DLAR 4500.15.

1-4. Administrative Storage

Administrative storage of equipment issued to and used by Army activities will have preventive maintenance performed in accordance with PMCS charts before storing. When removing the equipment from administrative storage, the PMCS should be performed to assure operational readiness. Disassembly and repacking of equipment for shipment or limited storage are covered in paragraph 3-16.

NOTE

COSMEC equipment must be removed before storage and turned into the COMSEC custodian.

1-5. Destruction of Army Electronics Materiel

Demolition and destruction of electronic equipment will be under the direction of the commander and in accordance with TM 750-244-2.

NOTE

In addition to the above listed procedures, refer to KAO-133 ()/TSEC for additional information on the TSEC/KG-27, Destruction of Army materiel to prevent enemy use; COMSEC equipment and keying information have first priority.

1-6. Reporting Equipment Improvement Recommendations (EIR)

If your AN/TRC-117 needs improvement, let us know. Send us an EIR. You, the user, are the only one who can tell us what you don't like about your equipment. Let us know why you don't like the design. Tell us why a procedure is hard to perform. Put it on an SF 368 (Quality Deficiency Report). Mail it to Commander, US Army Communications-Electronics Command and Fort Monmouth, ATTN: DRSEL-ME-MP, Fort Monmouth, NJ 07703. We'll send you a reply.

Section II. Description and Data

1-7. Purpose and Use

Radio Terminal Set AN/TRC-117(*) (fig. 1-1 and 1-2) is an air or vehicular transportable assemblage used to provide nonsecure or secure multiplex terminal and repeater facilities and

multichannel radio and cable telephone communications facilities using pulse code modulation (pcm) for Army and Corps Headquarters. The actual use of the assemblage is governed by the tactical situation and the requirements of the system planner. A

typical corps application of the AN/TRC-117(*) is shown in figure 1-3. For more detailed information on the capabilities of the system refer to paragraphs 2-1 and 2-2.

1-8. Description

(fig. 1-1, 1-2, 1-4 through 1-11 and FO-1)

All components of the AN/TRC-117(V)1 are housed in Shelter, Electrical Equipment S-330/TRC-117(V), S-330A/TRC-117(V), or S-330B/TRC-117(V). The shelters are fully insulated and weatherproofed and can be transported by air or ground vehicle. The operating components are mounted in equipment racks secured to the floor and walls of the shelter.

a. Lighting. Six fluorescent light fixtures are mounted in two rows on the ceiling of the assemblage (D, fig. FO-1) to provide primary lighting. Two incandescent lights in each row provide lighting when the temperature is too low for the fluorescent lights to start. The lighting may be controlled by a door interlock switch when blackout operation is not required.

b. Power Connections. Watertight receptacles are provided in the POWER & SIGNAL ENTRANCE BOX (fig. 1-9), on the rear wall of the assemblage (fig. 1-1), for connection to an external power source. Alternating current (ac) power may be provided by an engine-generator set, such as the PU-618/M, or from a central power source.

c. Antenna and Video Connections. Antenna cable receptacles and pcm video cable receptacles are mounted in the VIDEO & ANTENNA ENTRANCE BOX (fig. 1-11) on the roadside wall of the assemblage (fig. 1-2). Two antenna receptacles and two pairs of video connectors are provided.

d. Audio Signal Connections. Telephone line connections to the AN/TRC-117(*) are made through receptacles and binding posts in the SIGNAL ENTRANCE BOX (fig. 1-10) on the rear wall of the assemblage (fig. 1-1). A 26-pair receptacle and a bank of binding posts are provided for each system. Each 26-pair receptacle and each bank of binding posts (connected in parallel) provides connections for 12-voice frequency (vf) channels and two pairs of connections for the telephone (TA-312/PT) and (LS-147C/FI), intercom connections. Binding posts are also provided for the TA-312/PT and intercom connections in the POWER & SIGNAL ENTRANCE BOX.

e. Antenna and Mast Storage. Two Antennas AT-903/G are mounted on the roadside wall of the assemblage (fig. 1-5). The AT-903/G's are secured to mounting brackets with spring pins. Two Masts AB-577/GRC are stack-mounted against the curbside wall (fig. 1-4). Antenna Support AB-957/GRC is mounted to the loading chute on the assemblage floor. Seven Stakes GP-113/G are mounted against the side of the roadside equipment racks (F, fig. FO-1).

1-9. Differences Among Models

The AN/TRC-117(V)1 used low band radio equipment, band 1 components. The AN/TRC-117(V)2 uses high band radio equipment, band 2 components. Shelter S-330/TRC(V) uses the TD-204/U, TD-202/U, and TD-352/U. Shelter S-330A/TRC-117(V) and S-330B/TRC-117(V) can use the TD-202/U, TD-204/U, and TD-352/U. The S-330B/TRC-117(V) also has a patch panel which is designed for use with rear connections but can be used with front connections.

1-10. Tabulated Data

a. Systems Available.

| | |
|---|---|
| 12-channel radio terminal | 2 |
| 24-channel radio terminal | 1 |
| 12-channel cable terminal | 2 |
| 24-channel cable terminal | 1 |
| 12-or 24-channel cable to-radio conversion | 2 |
| 12-or 24-channel radio repeater | 1 |
| 24-channel radio repeater with 12- channel D/I | 1 |
| 12-, 24-, or 48-channel cable repeater | 1 |
| 24-channel cable repeater with 12- channel D/I | 1 |

NOTE

The combinations below represent maximum utilization of the equipment in the assemblage. Any part of any of the combinations may be used as the need dictates.

Combinations:

- 2 12-channel radio terminals with one 12/24/48-channel cable repeater.
- 1 24-channel radio terminal with one 12/24/48-channel cable repeater.

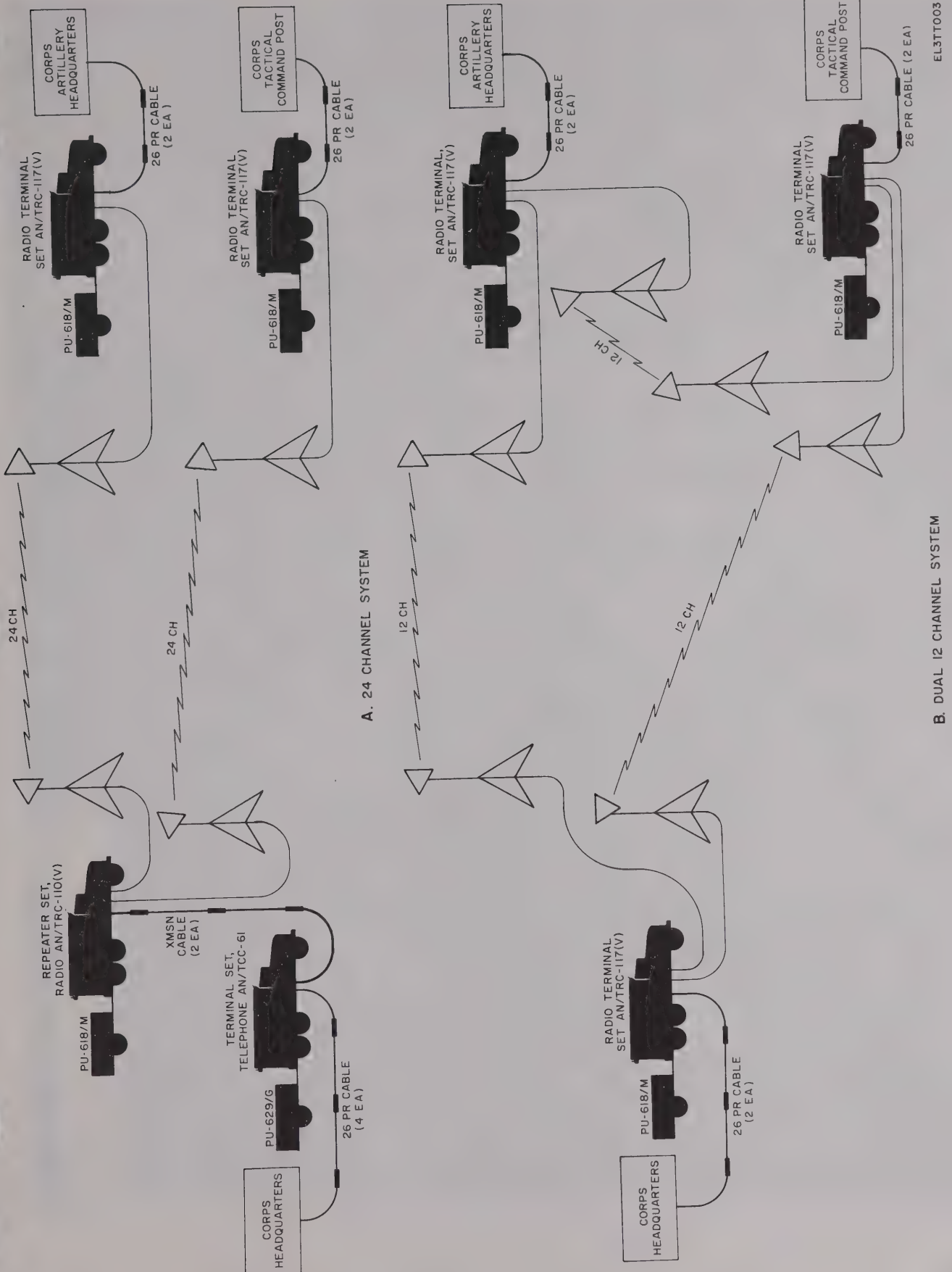


Figure 1-3. Typical applications of AN/TRC-117(*)

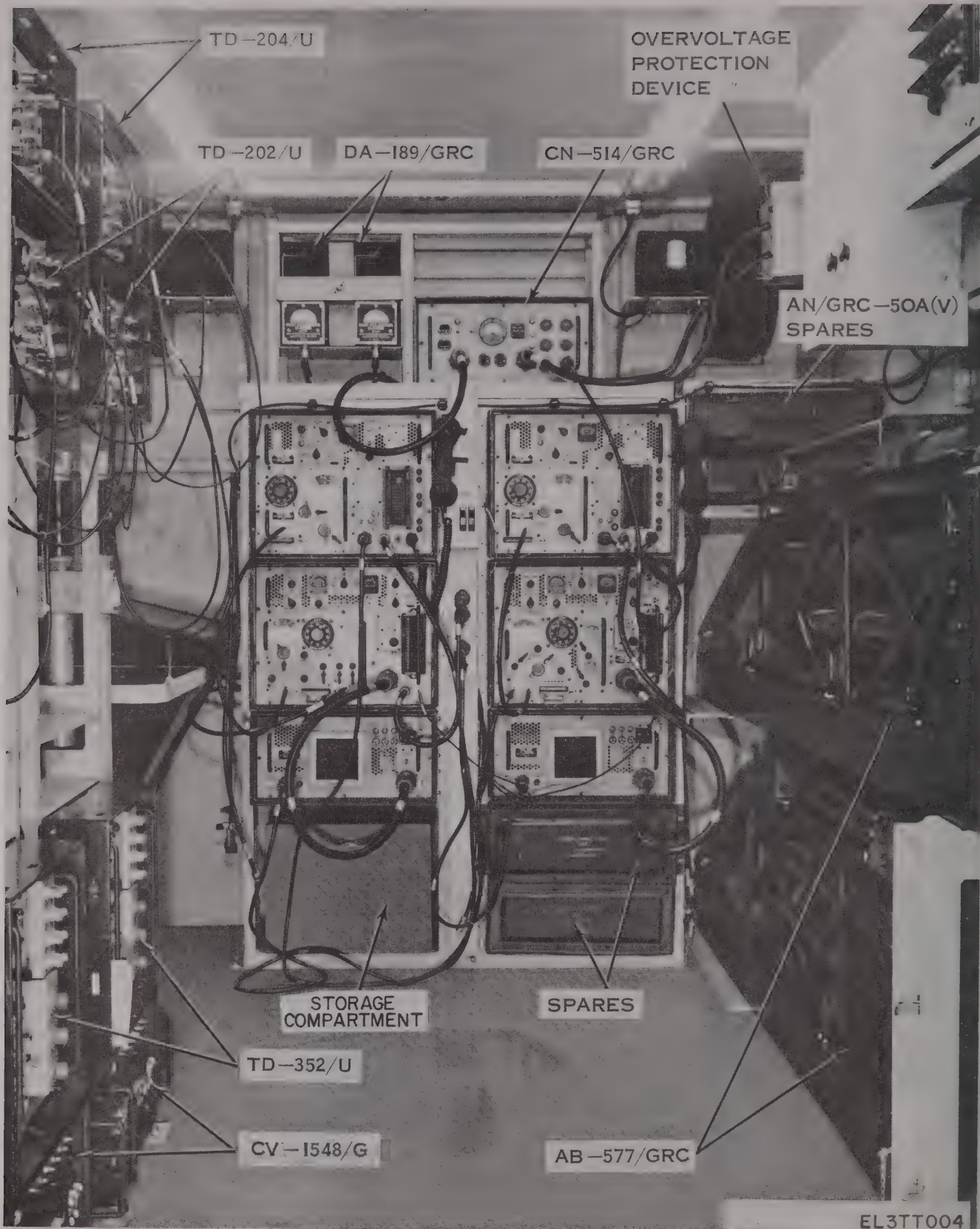


Figure 1-4. Radio Terminal Set AN/TRC-117(*), interior front view.

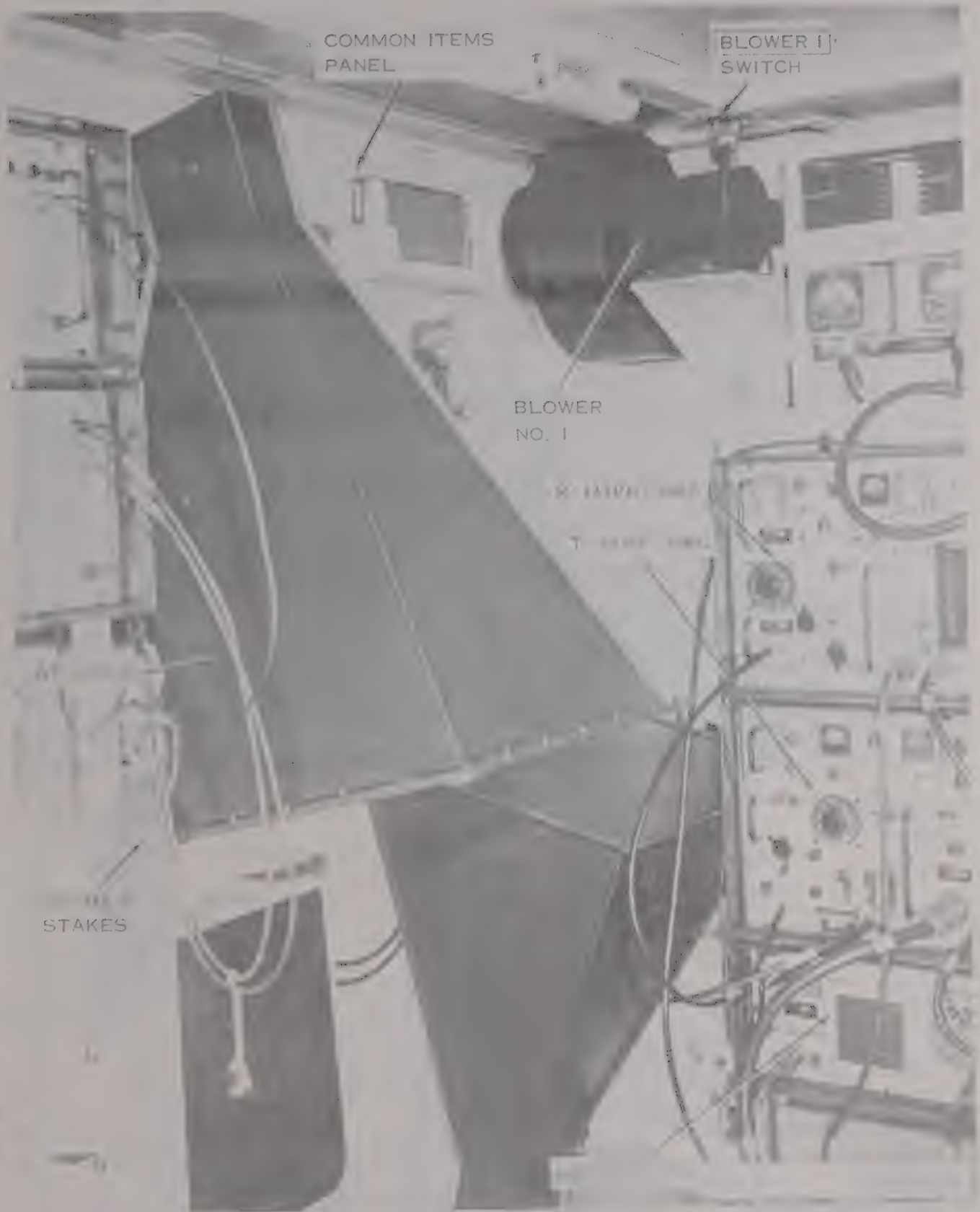
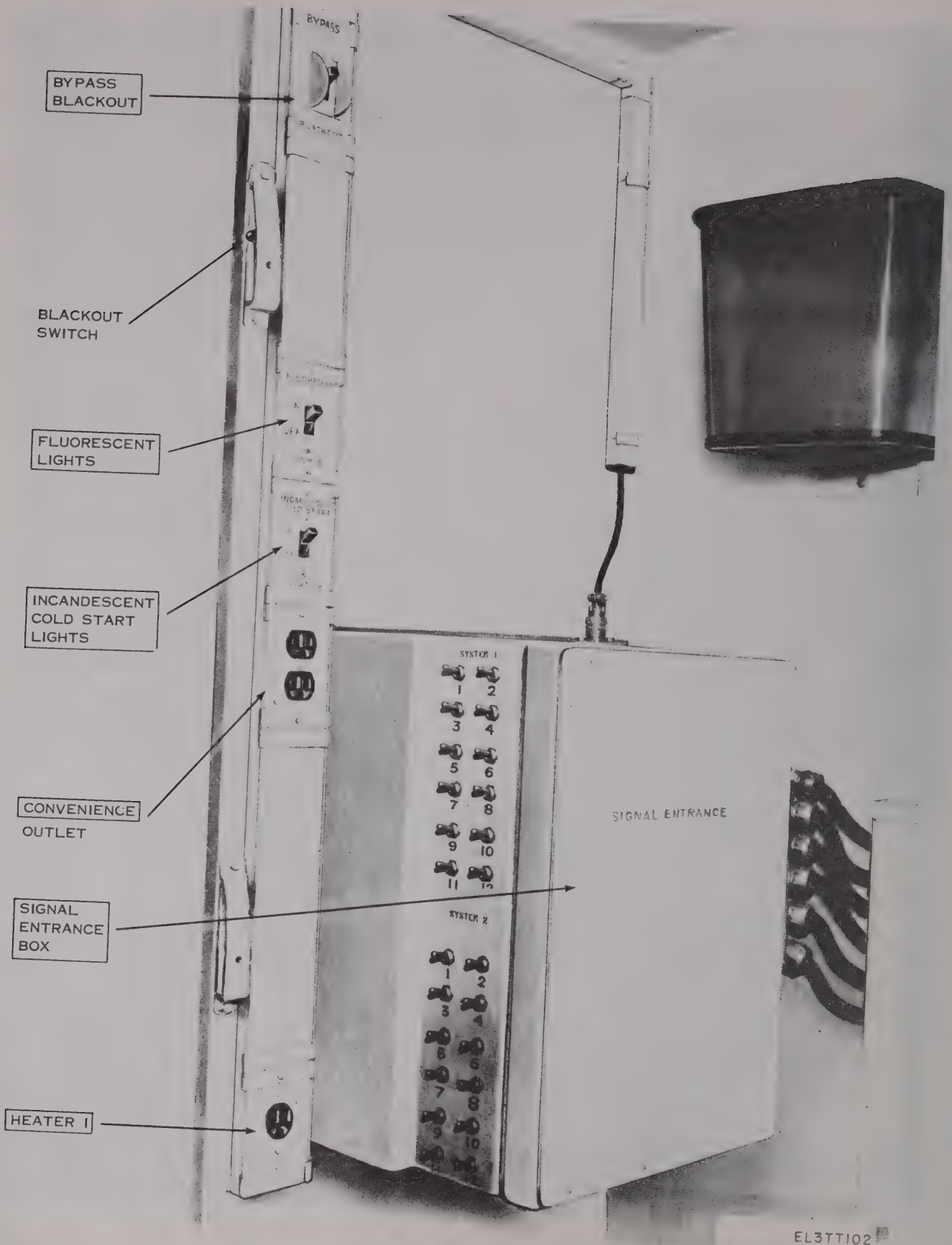
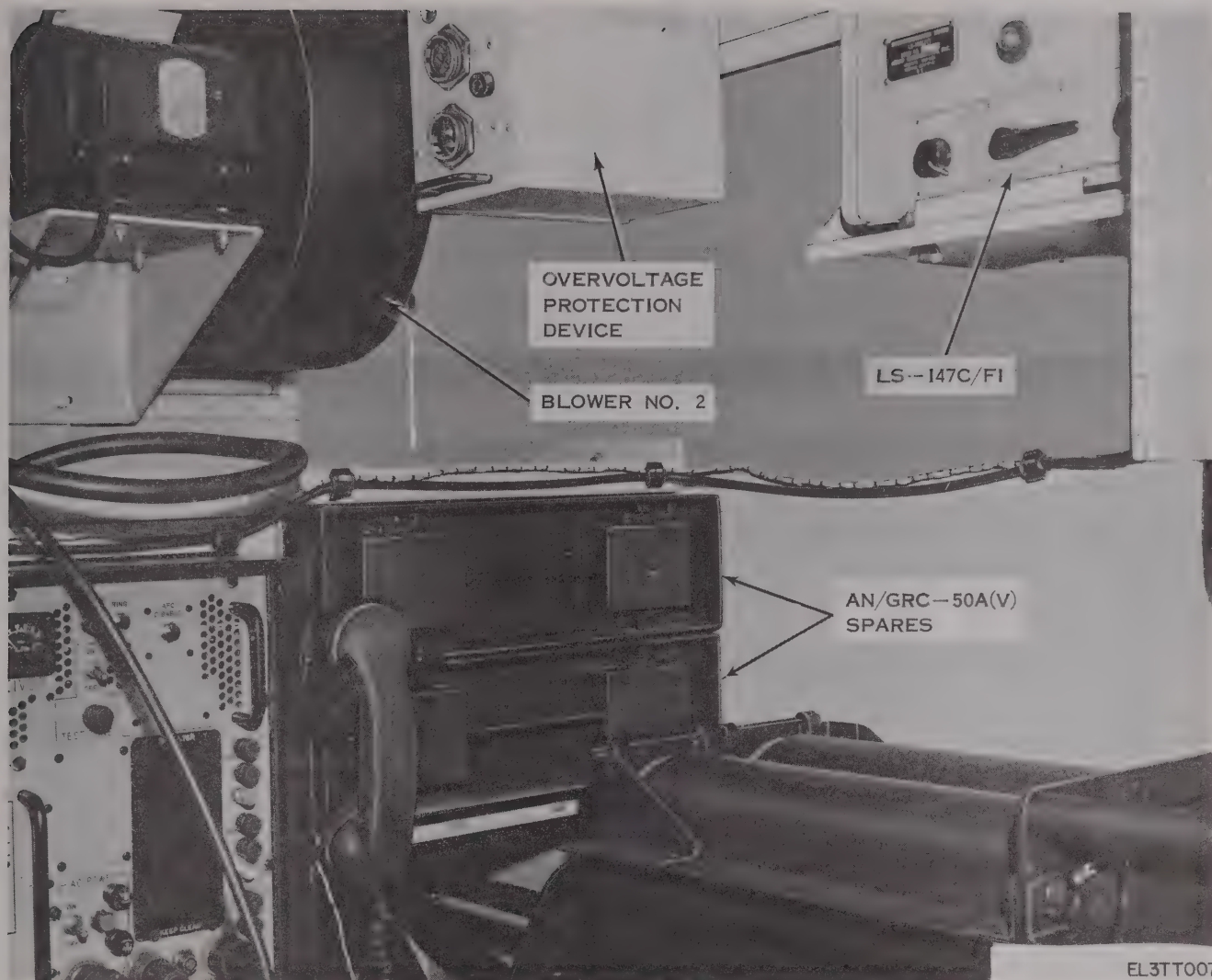


Figure 1-5. Radio Terminal Set AN/TRC-117(*),
Interior Front Roadside View.



EL3TT102

Figure 1-6. Radio Terminal Set AN/TRC-117(*).
Interior Rear Roadside View.



EL3TT007

Figure 1-7. Radio Terminal Set AN/TRC-117(*), interior front curbside view.

- 1 12-channel radio terminal with one 12- or 24-channel cable-radio conversion.
- 2 12-channel cable terminals with one 12- or 24-channel radio repeater.
- 1 24-channel cable terminal with one 12- or 24-channel radio repeater.
- 1 24-channel radio repeater with 12-channel local drop and insert, and one 12/24/48-channel cable repeater.
- 1 24-channel cable repeater with 12-channel drop and insert, and one 12- or 24-channel radio repeater.

b. Power Requirements.

Input voltage 115 volts \pm 6V,
50 to 60 Hz,
single phase

Consumption:

Fluorescent lights (6) 100 watts
Incandescent lights (4) 120 watts
Power distribution panel. 4 watts

Exhaust blowers (2)..... 500 watts
Heaters (2) 3,000 watts
PP-2054/GRC (2) includes
T-893(P)/GRC)
(P)/(GRC) 1,550 watts
R-1331(P)/GRC (2) 630 watts
CN-514/GRC 40 watts
TD-202/U (2) 60 watts
TD-204/U (2) 124 watts
TD-352/U (2) 272 watts
CV-1548/G (2) 120 watts
LS-147C/FI 40 watts
TSEC/KG-27 (2) 80 watts
Total:

Maximum 7,040 watts
Typical. 4,552 watts

fluorescent lights, one
heater, one blower, LS-
147C/FI, and two 12-
channel non-secure radio

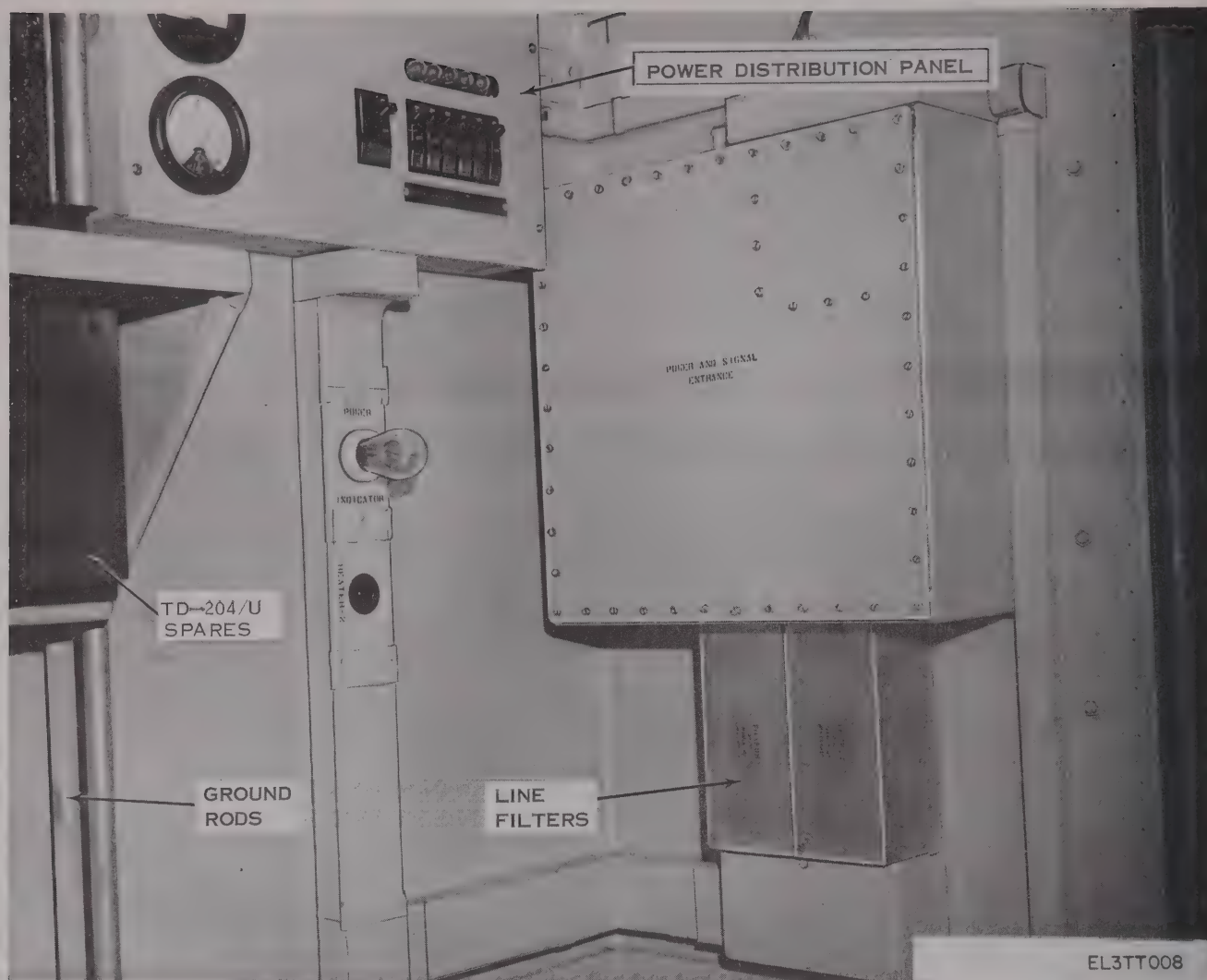


Figure 1-8. Radio Terminal Set AN/TRC-117(*), interior rear curbside view.

terminals operating).

c. Radio Signal Characteristics.

Operating bands:

AN/TRC-117(V)1 low band (AM-1955(*)/GRC and AM-1957/GRC):

Frequency range 601.5 to 999.5 MHz.

Channels 1 through 399

Channel separation 1 MHz

AN/TRC-117(V)2 high band (AM-1956(*)/GRC and AM-1958A/GRC):

Frequency range 1,350.5 to 1849.5 MHz

Channels 400 through 899

Channel separation 1 MHz

Transmitter output power:

Low band 15 to 30 watts

High band 8 to 20 watts

Voice channels available:

per radio system 12 or 24

d. Pcm Cable Characteristics.

Pulse type Binary dipulse

Pulse amplitude:

To cable 2 volts peak

From cable 30 mV RMS (nominal)

Cable type CX-4245/G (old type)
CX-11230/G (new preferred type)
CX-10734/G (cable adapter old to new types)

Input/output

impedance 62 ohms

Pulse rate and interval:

12-channel 576 kHz at 1736 nsec

24-channel 1,152 kHz at 868 nsec

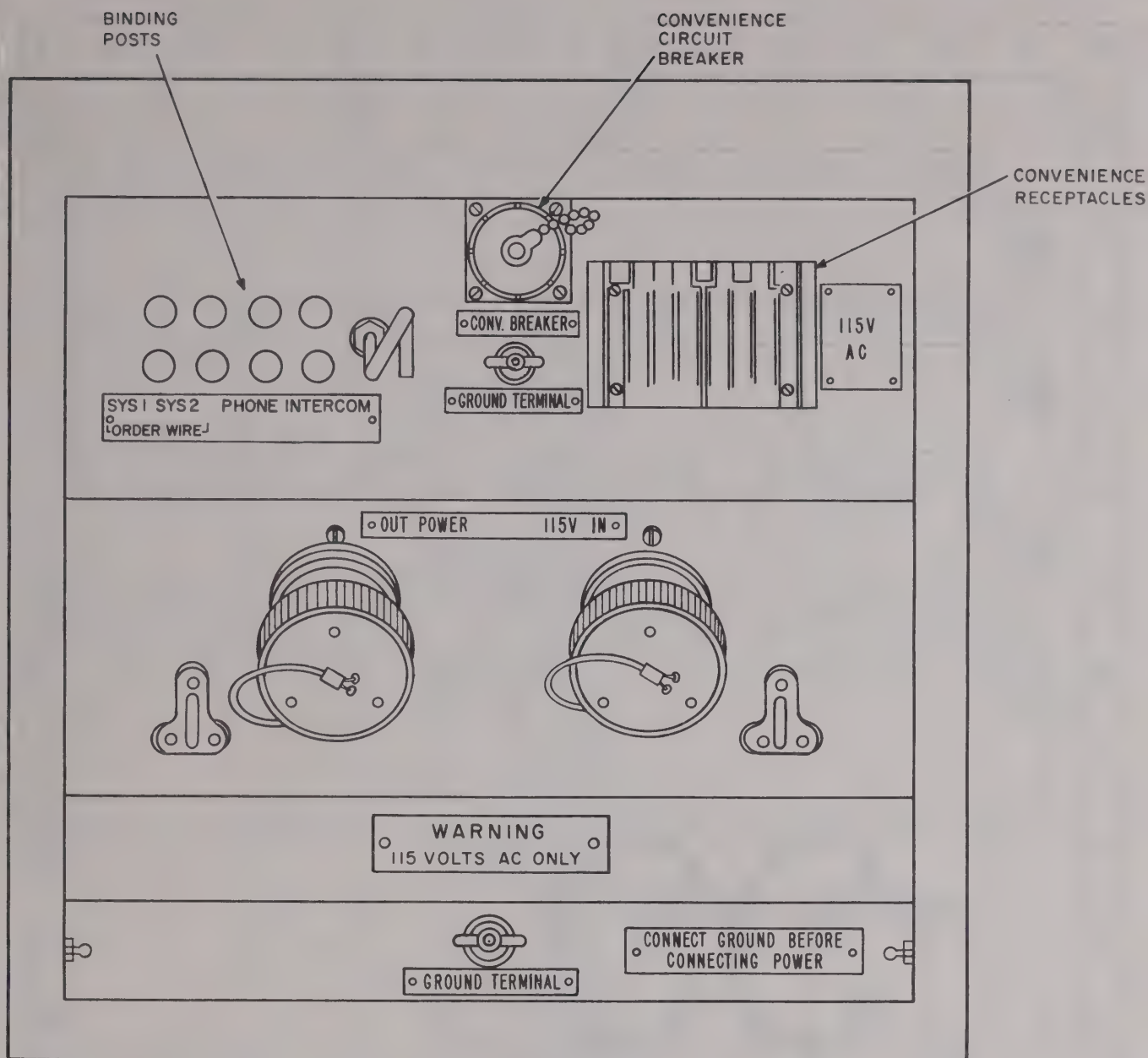
e. Telephone Signal Inputs and Outputs (CV-1548/G).

Number of channel

(per system) 12

Operating modes

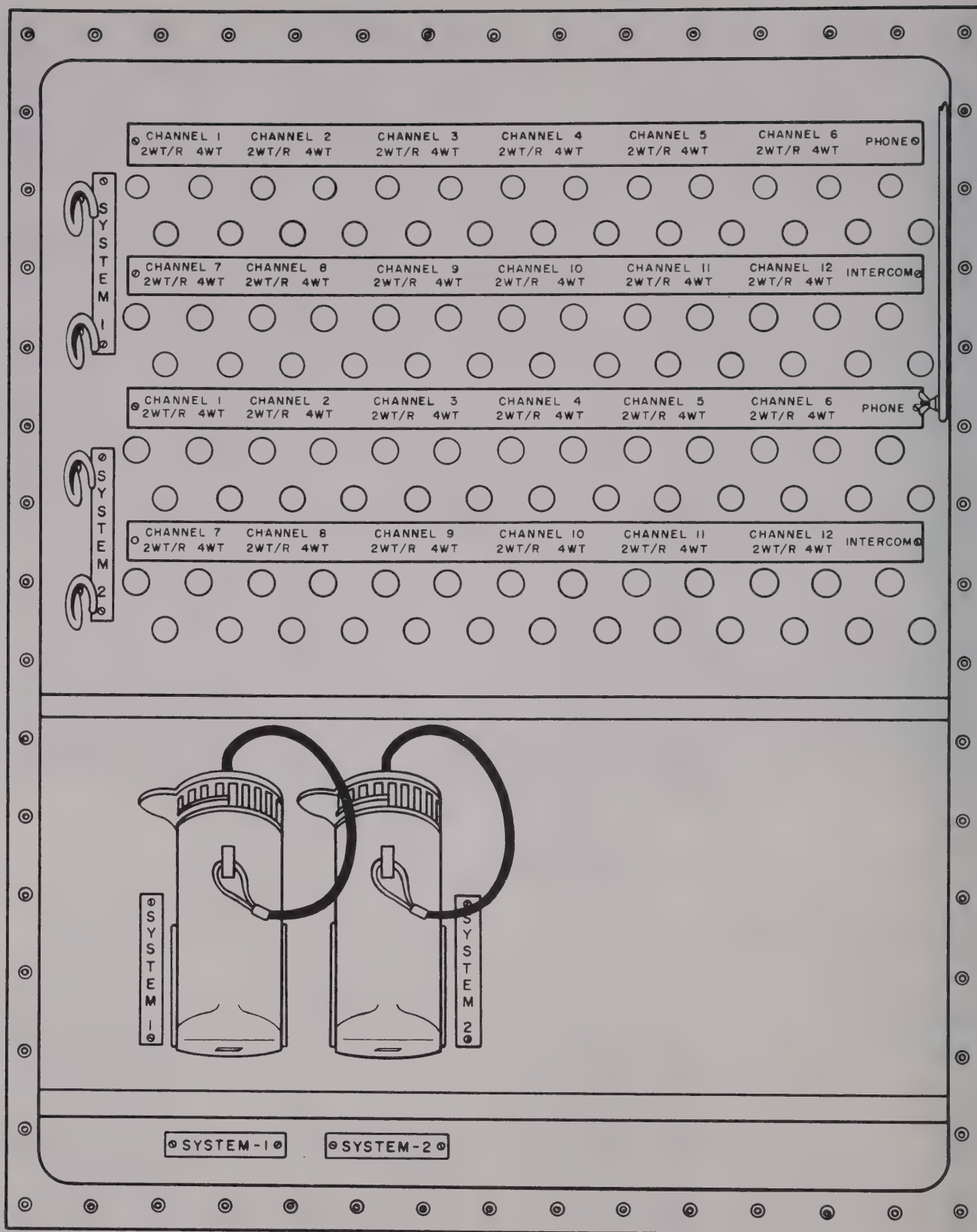
(selected inde- 20 Hz signaling,
2-wire.



EL3TT009

Figure 1-9. Power and Signal Entrance Box, exterior view, less cover.

| | | |
|--|--|---|
| pendently in each channel): | Plug supervision signaling (one way from originator to terminator). No signaling, 2-wire hybrid only in use). No signaling, 4-wire (channel patched straight through). | To subscriber 20 Hz ringing voltage at 75-volts minimum (across four lines simultaneously). |
| 20 Hz signaling 2-wire: | | Opens or closes tip (T) or ring (R) lead circuit. |
| From subscriber 20 Hz ringing voltage at 16-volts minimum. | | Channel characteristics (2-wire): |
| | | Insertion loss 4.5 db maximum (250 to 3500 Hz) |
| | | Input/output impedance 600 ohms (balanced to ground) |



EL3TTO10

Figure 1-10. Signal Entrance Box, exterior view, less cover.

EL3TTOII

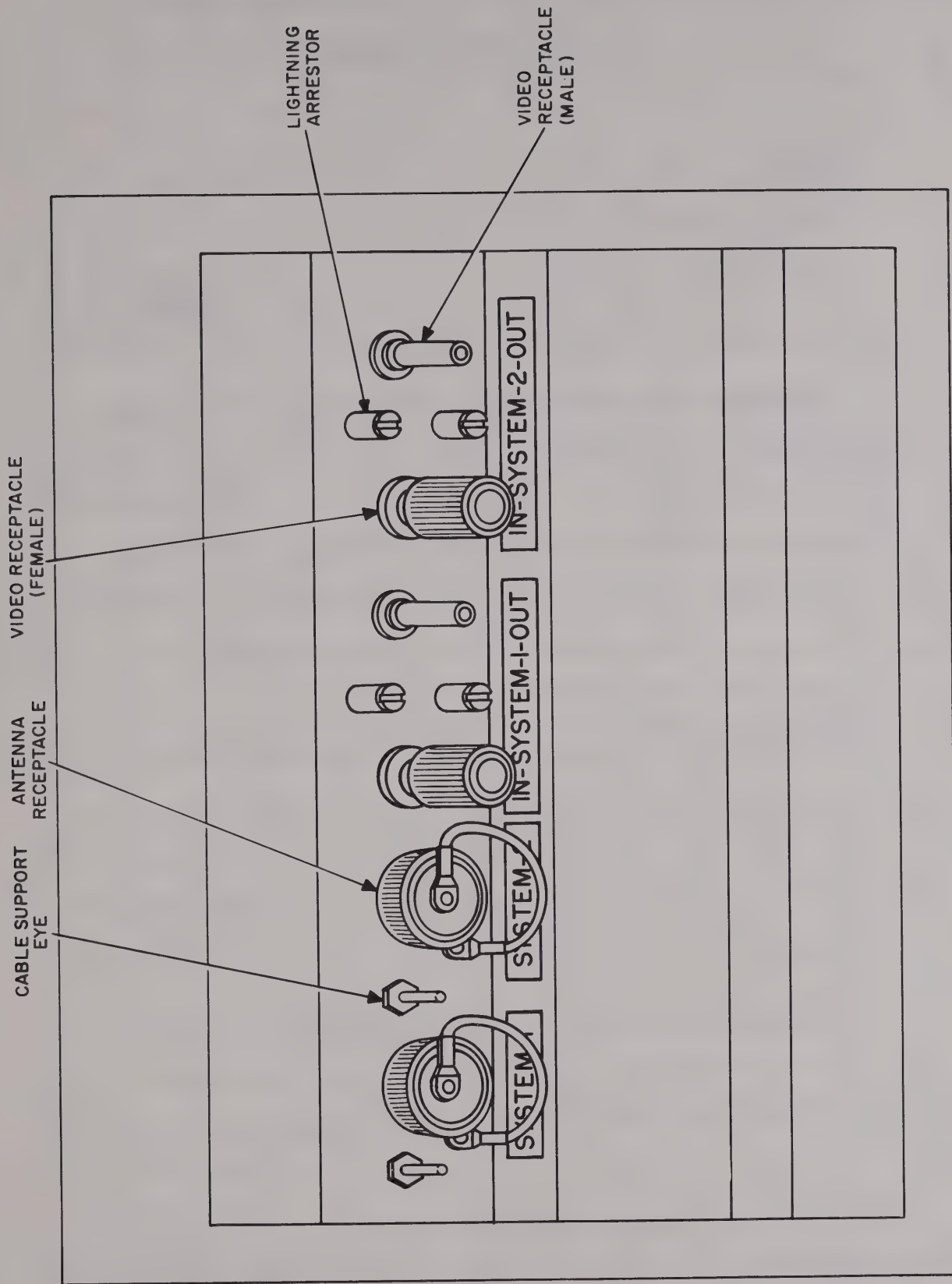





















Figure 1-11. Video and Antenna Entrance Box, exterior view, less cover.

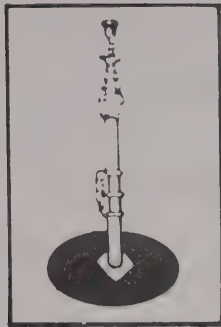
| VIDEO PATCH PANEL | | | | | PATCH THRU PATCH PANEL | | CABLE PATCH PANEL | |
|---------------------|-----------------------|-----------------------|-----------------------|-----------------------|---|--|---|--|
| SYSTEM 1 | | | | | SYSTEM 1 | | SYSTEM 1 | |
| TD-352 OR AUX | TD-202 | TD-204 | TD-352 OR AUX | TD-202 | AN/GRC-50 PATCH THRU | TD-204 PATCH THRU | SYSTEM 1 | |
| PCM OUT | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |  |  |  | |
| PCM IN | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |  |  |  | |
| TIM IN | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | SYSTEM 2 | |  | |
| TIM OUT | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |  | |  | |
| ALT PCM OUT | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |  | |  | |
| PCM IN-2 | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | ORDER WIRE PATCH PANEL | |  | |
| PCM OUT-2 | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | AN/GRC-50 ORDER WIRE | TD-202 ORDER WIRE | RADIO PATCH PANEL | |
| TIM OUT-2 | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | SYSTEM 1 | |  | |
| SYNC OUT XMTR | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |  |  |  | |
| SYNC IN | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | SYSTEM 2 | |  | |
| SYNC OUT RCVR | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |  | |  | |

EL3TT096

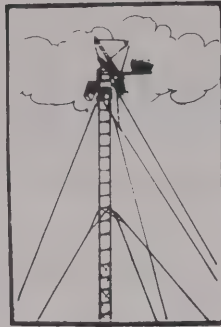
Figure 1-12. Patch panel.

FIXED OPERATION WITH LONG RANGE ANTENNAS

WARNING



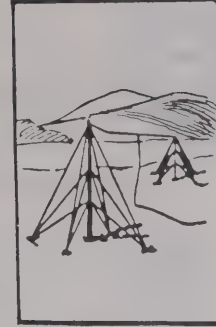
TELESCOPING ANTENNA
MAST



TYPICAL TOWER



EXTENDED RANGE
ANTENNA



DOUBLET ANTENNA

NEVER ERECT THESE LONG RANGE ANTENNAS DIRECTLY UNDER POWER LINES.

IF YOU MUST ERECT THESE LONG RANGE ANTENNAS NEAR POWERLINES, POWERLINE POLES OR TOWERS, OR BUILDINGS WITH OVERHEAD POWERLINE CONNECTIONS, NEVER PUT THE ANTENNA CLOSER THAN TWO TIMES THE ANTENNA HEIGHT FROM THE BASE OF THE POWERLINE, POLE, TOWER OR BUILDINGS.

NEVER ATTEMPT TO ERECT ANY LONG RANGE ANTENNA WITHOUT A FULL TEAM.

BEFORE ERECTING ANY LONG RANGE ANTENNA, INSPECT ALL THE PARTS MAKING UP THE ANTENNA KIT. DO NOT ERECT THE ANTENNA IF ANY PARTS ARE MISSING OR DAMAGED.

DO AS MUCH OF THE ASSEMBLY WORK AS POSSIBLE ON THE GROUND.

WHEN ERECTING THE ANTENNA, ALLOW ONLY TEAM PERSONNEL IN THE ERECTION AREA.

MAKE SURE THAT THE AREA FOR THE ANCHORS IS FIRM. IF THE GROUND IS MARSHY OR SANDY, GET SPECIFIC INSTRUCTIONS FROM YOUR CREW CHIEF OR SUPERVISOR ON HOW TO REINFORCE THE ANCHORS.

WHEN SELECTING LOCATIONS FOR ANCHORS, AVOID TRAVELED AREAS AND ROADS. IF YOU CANNOT AVOID THESE AREAS, GET SPECIFIC INSTRUCTIONS FROM YOUR SUPERVISOR AS TO WHAT CLEARANCE YOUR GUY WIRES AND ROPES MUST HAVE OVER THE TRAVELED AREAS AND ROAD.

CLEARLY MARK ALL GUY WIRES AND ROPES WITH THE WARNING FLAGS OR SIGNS SUPPLIED BY YOUR UNIT. IN AN EMERGENCY, USE STRIPS OF WHITE CLOTH AS WARNING STREAMERS.

IF YOU SUSPECT THAT POWERLINES HAVE MADE ACCIDENTAL CONTACT WITH YOUR ANTENNA, STOP OPERATING, ROPE OFF THE ANTENNA AREA, AND NOTIFY YOUR SUPERIORS.

IF THE WEATHER IN YOUR AREA CAN CAUSE ICE TO FORM ON YOUR LONG RANGE ANTENNA AND ITS GUY WIRES AND ROPES, ADD EXTRA GUYS TO SUPPORT THE SYSTEM. ROPE OFF THE AREA AND POST IT WITH WARNING SIGNS LIKE "BEWARE OF FALLING ICE".

DO NOT TRY TO ERECT ANY ANTENNA DURING AN ELECTRICAL STORM.

KEEP A SHARP EYE ON YOUR ANCHORS AND GUYS. CHECK THEM DAILY AND IMMEDIATELY BEFORE AND AFTER BAD WEATHER.

EL3TT079

Fixed Operations With Long Range Antennas.

f. Local Communications Facilities.

Intercom.....LS-147C/FI
Telephone.....TA-312/PT

g. Mechanical Characteristics, AN/TRC-117().*

Dimensions:

Length 147 inches
Width 87 inches
Height 83 inches
Weight 5080 pounds
Volume 614 cubic feet



5

SAFETY STEPS TO FOLLOW IF SOMEONE
IS THE VICTIM OF ELECTRICAL SHOCK

1

DO NOT TRY TO PULL OR GRAB THE INDIVIDUAL

2

IF POSSIBLE , TURN OFF THE ELECTRICAL POWER

3

IF YOU CANNOT TURN OFF THE ELECTRICAL
POWER, PULL, PUSH, OR LIFT THE PERSON TO
SAFETY USING A WOODEN POLE OR A ROPE OR
SOME OTHER INSULATING MATERIAL

4

SEND FOR HELP AS SOON AS POSSIBLE

5

AFTER THE INJURED PERSON IS FREE OF
CONTACT WITH THE SOURCE OF ELECTRICAL
SHOCK, MOVE THE PERSON A SHORT DISTANCE
AWAY AND IMMEDIATELY START ARTIFICIAL
RESUSCITATION

EL3TT080

Five First Aid Steps.

CHAPTER 2

SERVICE UPON RECEIPT AND INSTALLATION

Section I. SYSTEMS PLANNING AND SITE REQUIREMENTS

2-1. Systems Planning

a. The AN/TRC-117(*) contains two complete equipment systems. Each of the systems contains the following major operating components: Transmitter, Radio T-893(P)/GRC, Receiver, Radio R-1331(P)/GRC, Power Supply PP-2054/GRC, Mast AB-577/GRC, Antenna AT-903/G, Multiplexer TD-352/U, Multiplexer TD-204/U, Converter, Telephone Signal CV-1548/G, and share items such as a Voltage Regulator CN-514/GRC and local communication facilities consisting of Telephone Set TA-312/PT and Intercommunications Station LS-147C/FI. Each of the radio transmitters includes either Amplifier-Oscillator AM-1957/GRC or AM-1958A/GRC. Each radio receiver includes either Amplifier-Converter AM-1995A/GRC or AM-1956/GRC. The AM-1957/GRC and AM-1955A/GRC operate in the low band (601.5 to 999.5 MHz). The AM-1956A/GRC and AM-1958/GRC operate in the high band (1,350.5 to 1,849.5 MHz). Both systems share a Voltage Regulator CN-514/GRC. If secure operations are required, each system used the Communications Security Equipment TSEC/KG-27.

b. The systems may be interconnected as a 12- or 24-channel pulse code modulation (pcm) radio terminal, a 12- or 24-channel pcm cable terminal, a 12-

or 24-channel cable-radio conversion, a 12- or 24-channel radio repeater, a 24-channel radio repeater with 12-channel local or remote drop and insert (D/I) facilities, a 12-, 24-, or 48-channel cable repeater, or a 24-channel cable repeater with 12-channel local D/I facilities. A typical corps application of the AN/TRC-117(*) is shown in figure 1-3. The components used in each configuration are shown in figures 2-1 through 2-5. Any of the terminal applications may be connected as secure or non-secure circuits. Adapter Connector UG-1923/G (fig. 2-6) must be used with the TD-352/U during secure operation.

2-2. Siting

The best operating site for the AN/TRC-117(*) is determined by the tactical situation and other local conditions. When a site is chosen where the AN/TRC-117(*) is to be placed on the ground, the area should be firm and dry, with good drainage. After the site is prepared, the assemblage should be placed on concrete blocks or wooden beams, if possible, and positioned to facilitate connections of power and signal cables. If a generator set is used to provide power, it should be located approximately 75 feet away from the assemblage to minimize fire hazard and generator noise interference.

Section II. SERVICE UPON RECEIPT OF MATERIAL

2-3. Unpacking

(fig. 2-7)

a. *Packaging Data.* The AN/TRC-117(*) is packed in a reusable wooden crate. The S-330(*)/TRC-117(*), which houses the equipment, is anchored to eyebolts in the skid base ends with lumber. The skid base has entries for handling with a forklift. The dimensions of the crate are 155 by 93 by 94 inches; the volume is 874 cubic inches, and the weight of the crated AN/TRC-117(*) is approximately 6080 pounds.

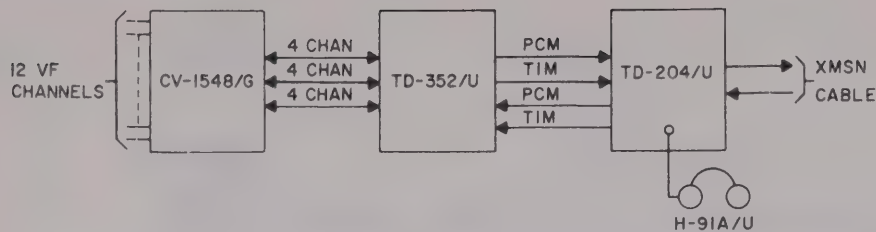
b. *Removal from Crate.*

CAUTION

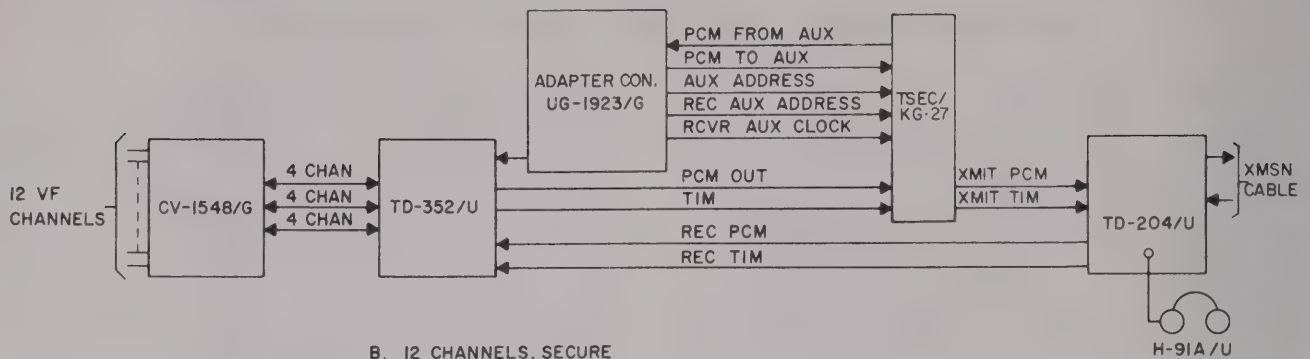
Do not thrust any tools into the interior of any pack or package.

(1) Unfasten the lag bolts with wrenches and remove the top, front, rear and sides from the crate base.

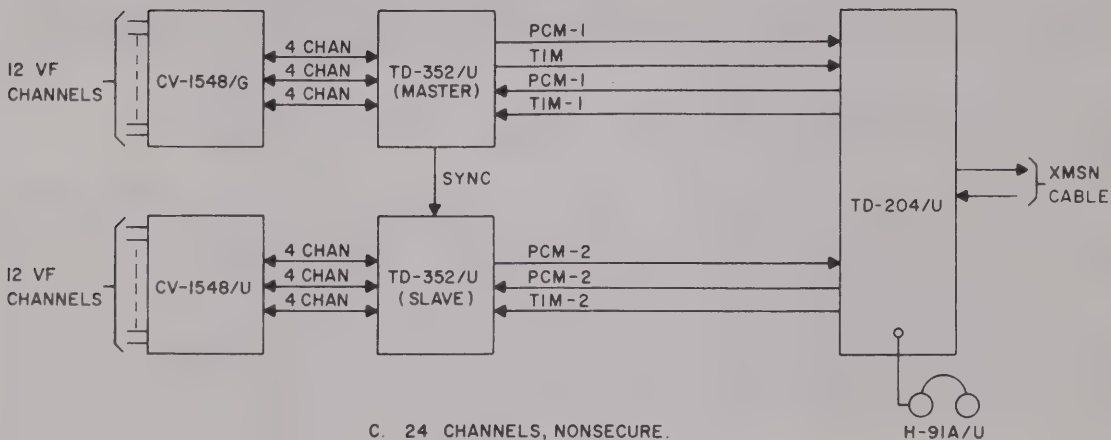
(2) Detach the tiedowns from the eyebolts in the base of the crate. When cable or tiedown rods are used for anchoring, loosen the turnbuckles.



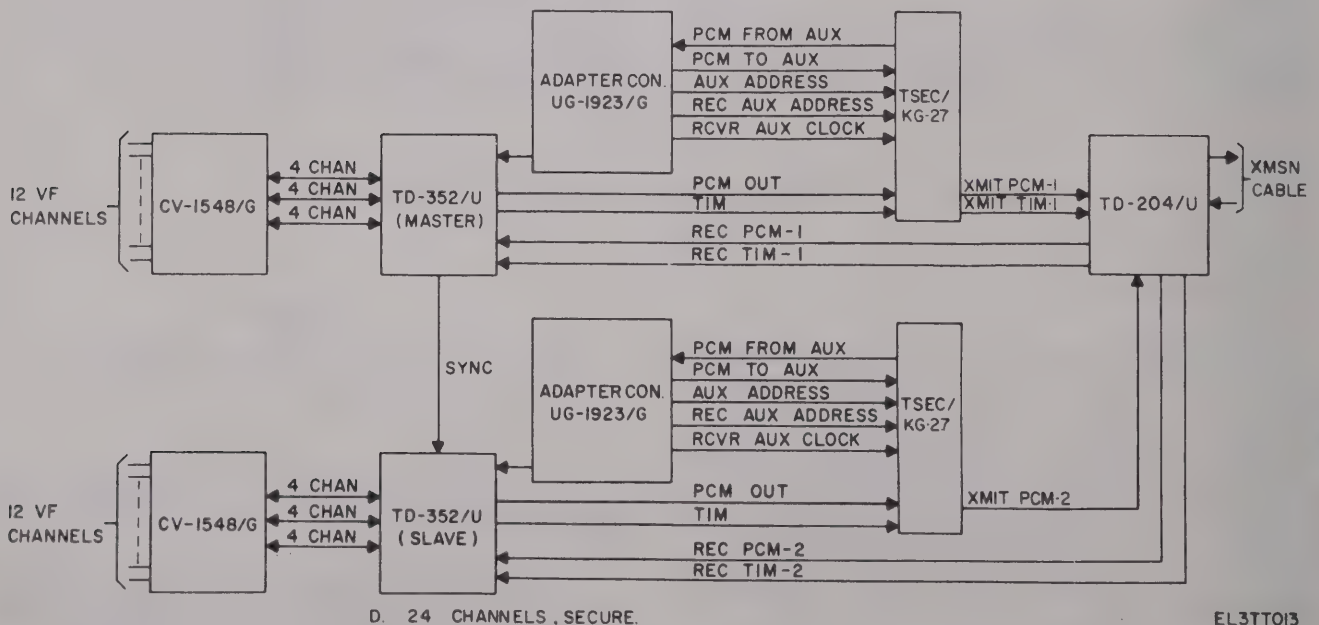
A. 12 CHANNELS, NONSECURE



B. 12 CHANNELS, SECURE

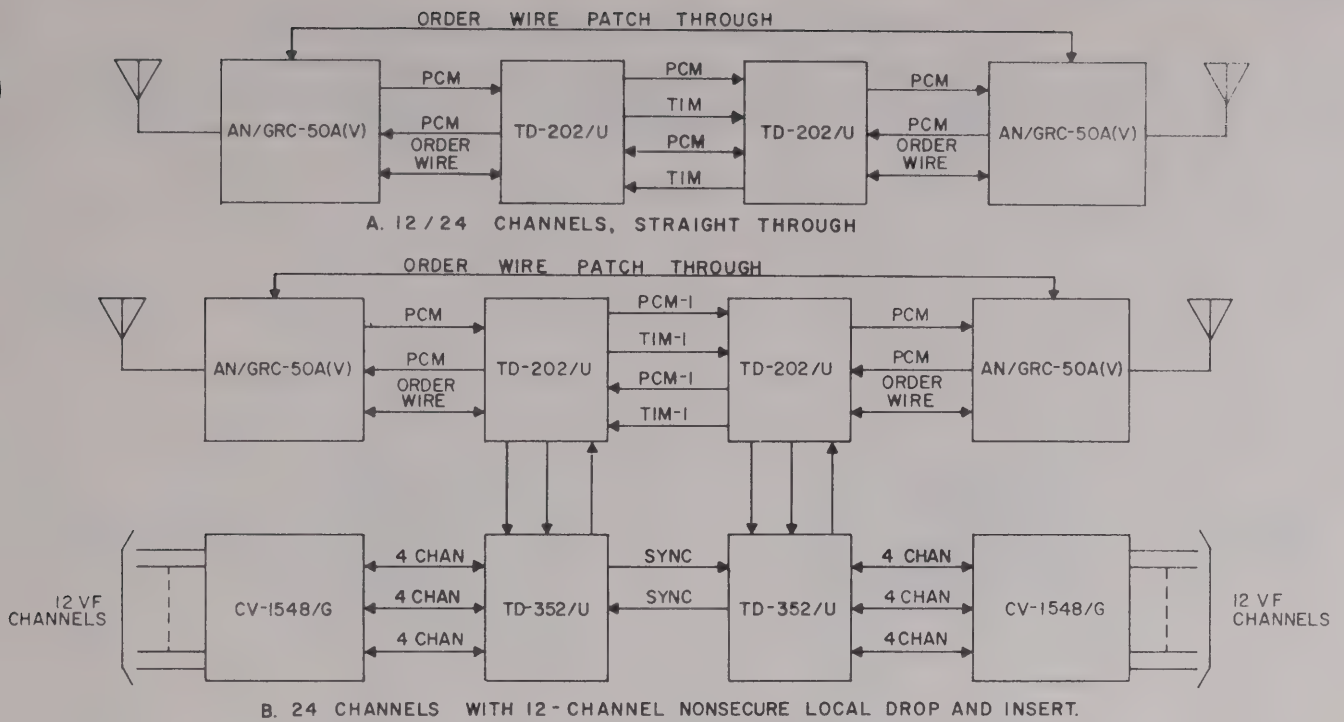


C. 24 CHANNELS, NONSECURE.



D. 24 CHANNELS, SECURE.

Figure 2-2. AN/TRC-117(*) cable terminal applications, block diagram.



EL3TT014

Figure 2-3. AN/TRC-117(*) radio repeater applications, block diagram (straight through and 24-channels with 12-channel nonsecure drop and insert).

(3) Remove the wooden blocking from the sides and ends of the assemblage.

CAUTION

Be careful when handling tools, because the aluminum skin of the S-330(*)/TRC-117(*) can be easily damaged.

(4) Remove the assemblage from the crate base. Use overhead lifting equipment whenever available; if it is not available, remove the headers from the crate base, lift the shelter from either side with a forklift, or drag it from the crate base by the towing eyes.

(5) Forward the crate (reassembled, or with the sections tied together) to a local storage area if practicable. The crate may be reused for shipment of similar items.

2-4. Checking Unpacked Equipment

a. Inspect the equipment for damage incurred during shipment. If the equipment has been damaged, report the damage on **SF 364** (para 1-3b).

b. Check the equipment against the component listing (appx B) and the packing slip to see if the shipment is complete. Report all discrepancies in accordance with paragraph 1-3c. The equipment should be placed in service even though a minor assembly, or part that does not affect proper functioning, is missing.

c. Check to see whether the equipment has been modified. (Equipment which has been modified will have the MWO number on the front panel, near the nomenclature plate.) Check also to see whether all currently applicable MWO's have been applied. (Current MWO's applicable to the equipment are listed in DA Pam 310-6 or DA Pam 310-7 as applicable.)

Section III. INSTALLATION INSTRUCTIONS

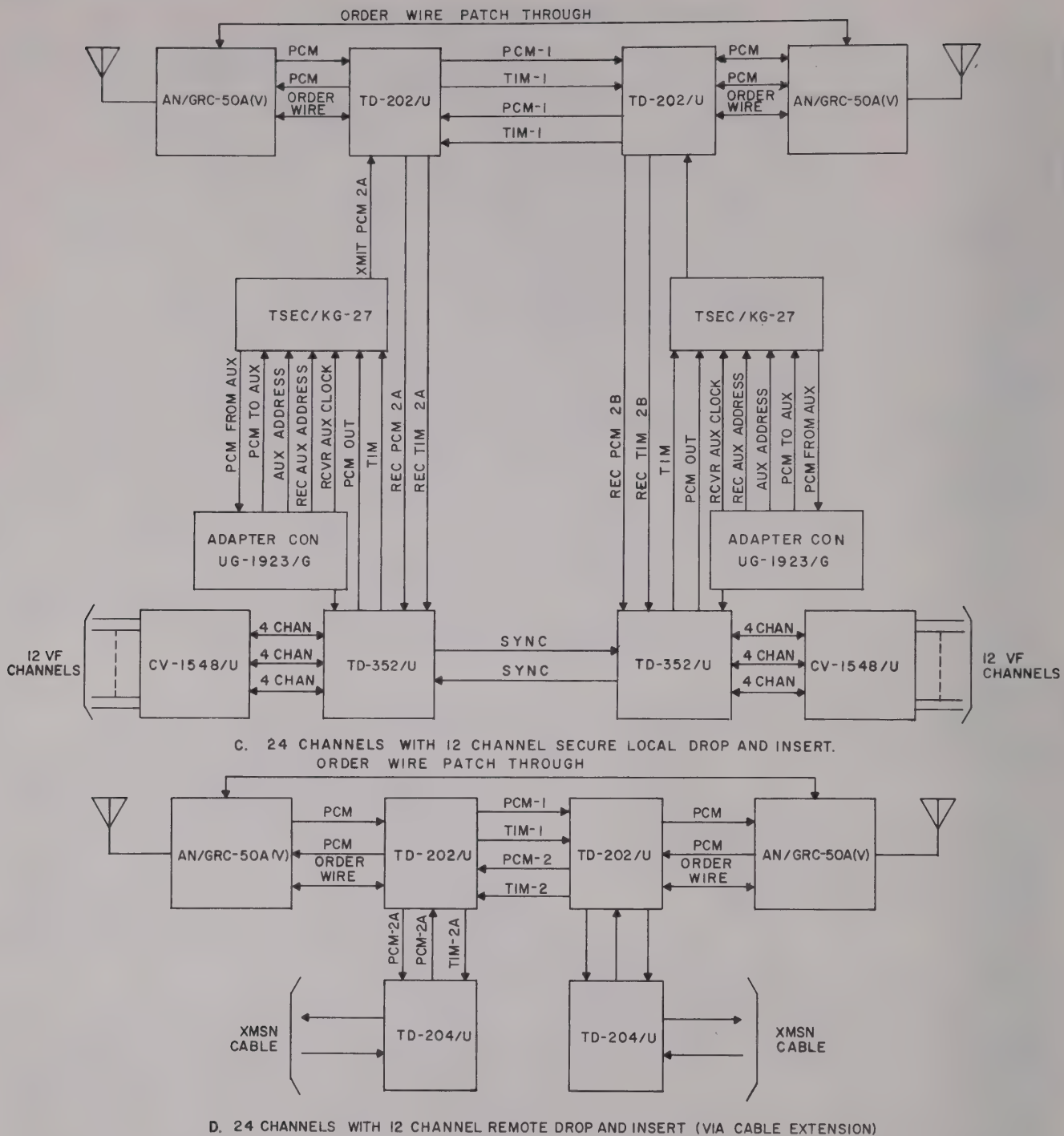
2-5. Truck Installation

(fig. 2-8 and 2-9)

WARNING

To avoid injury to personnel, or damage to equipment, only personnel engaged in the

actual loading operation should be permitted near the truck, lifting device, and assemblage. To eliminate confusion, all instructions must come from the loading crew supervisor.



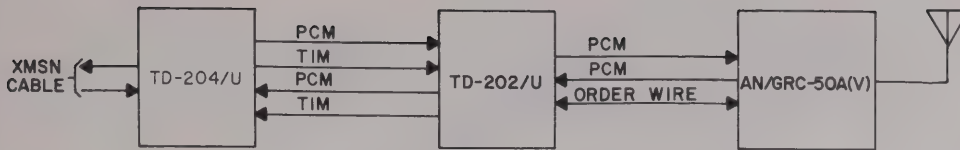
EL3TT015

Figure 2-4. AN/TRC-117(*) radio repeater applications, block diagram (24-channels with 12-channel secure local drop and insert and 24-channels with 12-channel remote drop and insert).

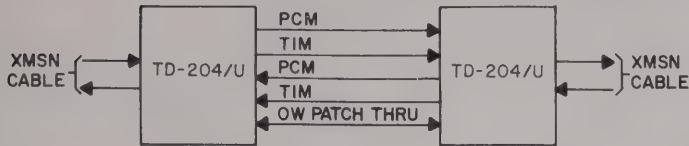
a. Use the sling hooks (nearest turnbuckle) to connect the sling assemblies to the lifting and tie-down eyes of the assemblage (fig. 2-8). Connect the sling hooks, at the opposite ends of the cables, to the lifting ring, and place the lifting ring over the lifting hook of the lifting device.

b. Tie a 1/2 inch rope (at least 15 feet long) to each rear towing eye.

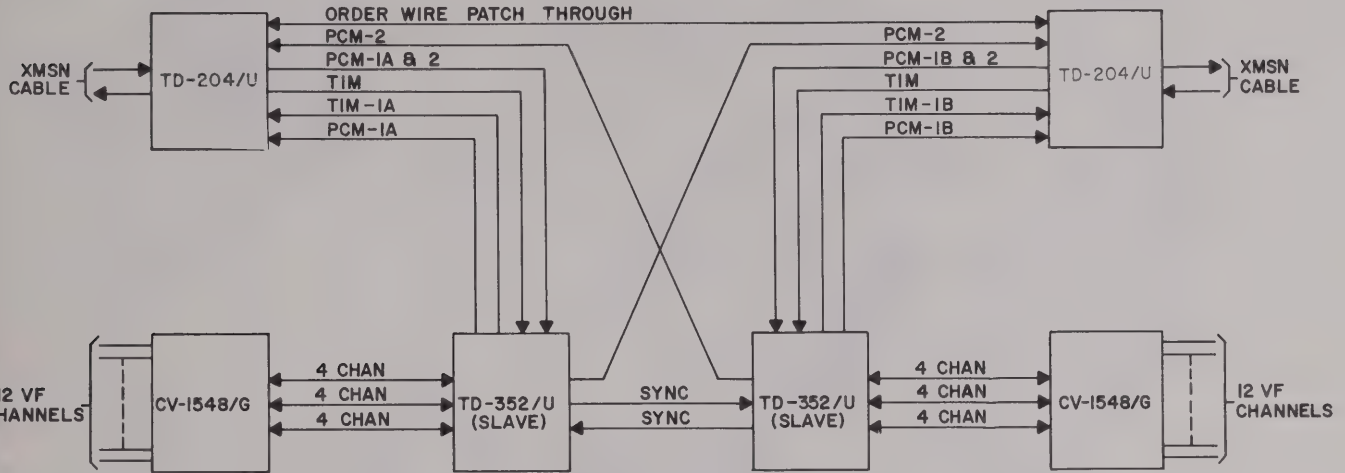
c. Lower the tailgate of the truck; make sure that all tools and equipment have been removed from the body of the truck. Slowly lift the assemblage high enough to clear the body of the truck.



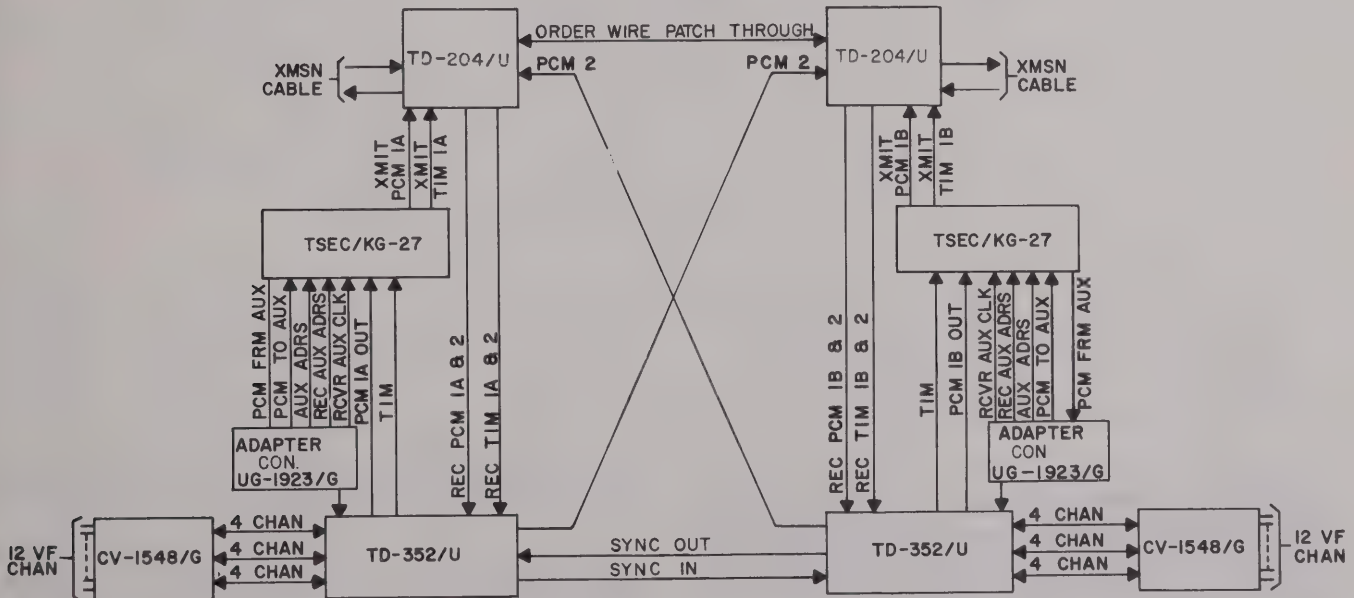
A. CONVERSION, 12/24 CHANNELS.



B. 12/24/48 CHANNELS.



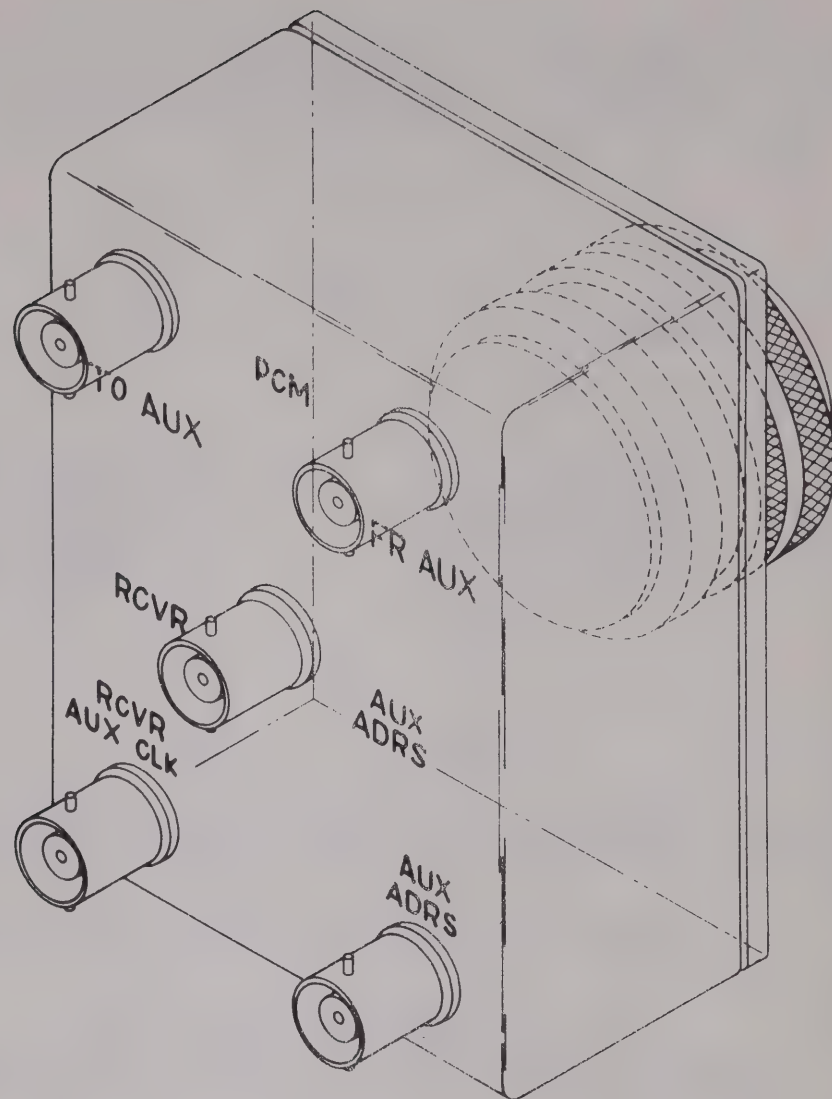
C. 24 CHANNELS WITH NONSECURE 12-CHANNEL LOCAL DROP AND INSERT.



D. 24 CHANNELS, WITH SECURE 12-CHANNEL LOCAL DROP AND INSERT.

EL3TTO16

Figure 2-5. AN/TRC-117(*) cable repeater applications, block diagram.



EL3TTO17

Figure 2-6. Adapter Connector UG-1923/G.

NOTE

The entrance door of the assemblage must be at the rear of the truck, and the front end of the assemblage must be flush against the front of the truck body.

d. Position a person at the free end of each of the 1/2 inch ropes to guide the assemblage. Back the truck slowly into position under the assemblage and lower the assemblage onto the truck.

WARNING

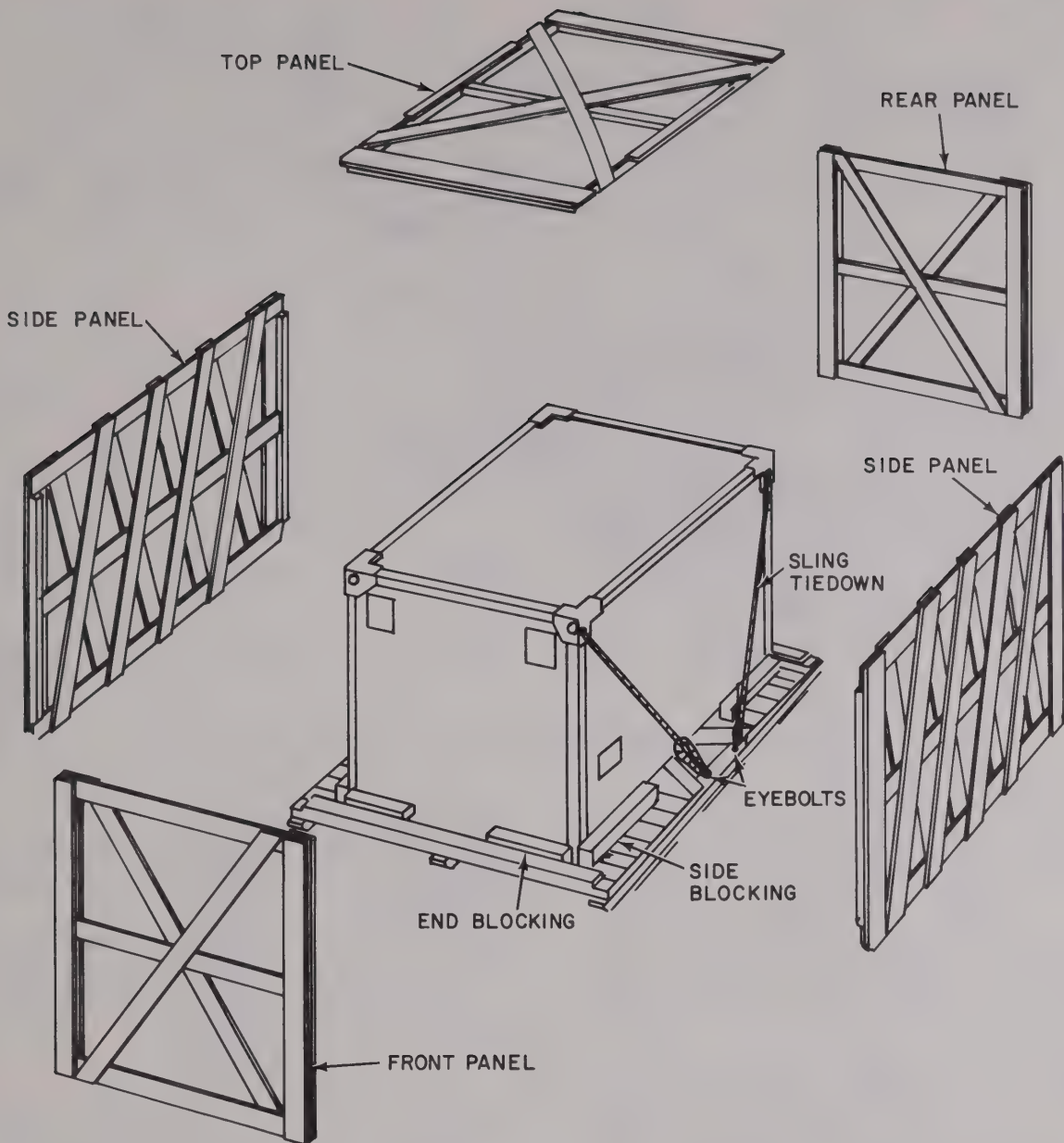
All personnel must remain clear of the truck while the assemblage is being lowered onto the truck.

e. Remove the lifting ring from the lifting hook and disassemble the lifting ring and the sling hooks. Remove the sling hooks from the lifting and tiedown eyes and the 1/2-inch rope from the rear towing eyes. Raise and secure the truck tailgate.

f. Install a tiedown ring assembly (part of the sling assembly) above the center support of each cargo bed side rail of the truck (A, fig. 2-9).

g. At each side of the assemblage, use the hook at the end farthest from the turnbuckle to hook each sling assembly to a lifting and tiedown eye of the assemblage. Secure the sling hooks at the opposite end of the cables to the tiedown ring (B, fig. 2-9).

h. Tighten all turnbuckles evenly by hand, and then turn each turnbuckle an additional one-half turn with a bar or rod inserted into the slot of the turnbuckle.



EL3TT018

Figure 2-7. Typical packaging diagram.

CAUTION

Do not overtighten the turnbuckles. Overtightening turnbuckles will damage the assemblage.

i. After the truck is driven to the operating site, lower the tailgate to the horizontal position; then remove the ladder from the assemblage and secure it to the left side of the tailgate.

2-6. Unloading Assemblage

To unload the assemblage from the truck, reverse the procedures given in paragraph 2-5.

2-7. Grounding

The AN/TRC-117(*) must be properly grounded *before* input power is connected. Select a grounding site (within 6 feet of the POWER & SIGNAL ENTRANCE BOX) that is low and damp, and that will not interfere with the entrance door, field wires, antenna, power or signal cables.

a. Loosen and lift the cover of the POWER & SIGNAL ENTRANCE BOX (fig. 1-1).

b. Use the cover support to secure the cover in the open position.

c. Remove a ground rod and the sledge hammer

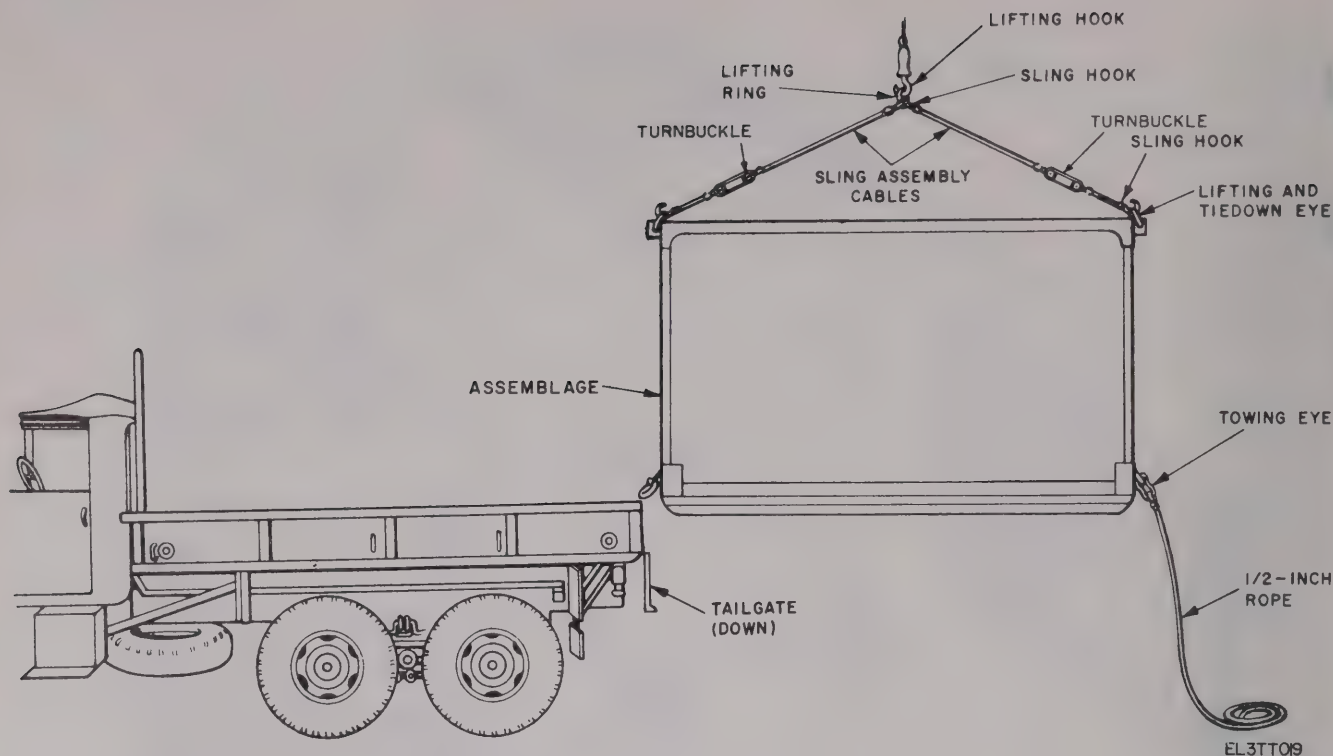


Figure 2-8. Lifting and loading AN/TRC-117(*) on truck.

from their mountings in the assemblage (C, fig. FO-1).

d. Remove any dirt or grease from the ground rod.

e. Scoop out a small hole, about 6 inches deep, at the selected grounding site.

f. Drive the ground rod into the hole until the top of the ground rod is approximately 3 inches above the bottom of the hole.

g. Remove a 10-foot ground strap from the storage drawer in the assemblage and connect one end of the ground strap to the ground rod and the other end to the lower GROUND TERMINAL in the POWER & SIGNAL ENTRANCE BOX (fig. 1-9).

h. Saturate the ground around the rod with water to keep it moist.

j. If a generator set is used to supply ac power, ground it the same way as the assemblage.

2-8. Power Connections

CAUTION

Grounding connections (para 2-7) must be completed before power is connected to the AN/TRC-117(*).

Ac power for the assemblage may be obtained from Generator Set PU-618/M (b below) or from a central power source (c below).

a. Preliminary Procedures.

(1) Make sure that all circuit breakers and equipment power switches in the assemblage are in the off position.

(2) Remove the power cable assembly and cable reel (F, fig. FO-1) from the assemblage.

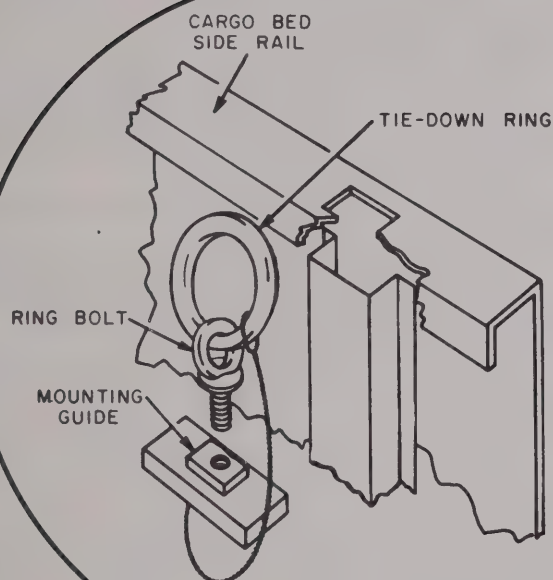
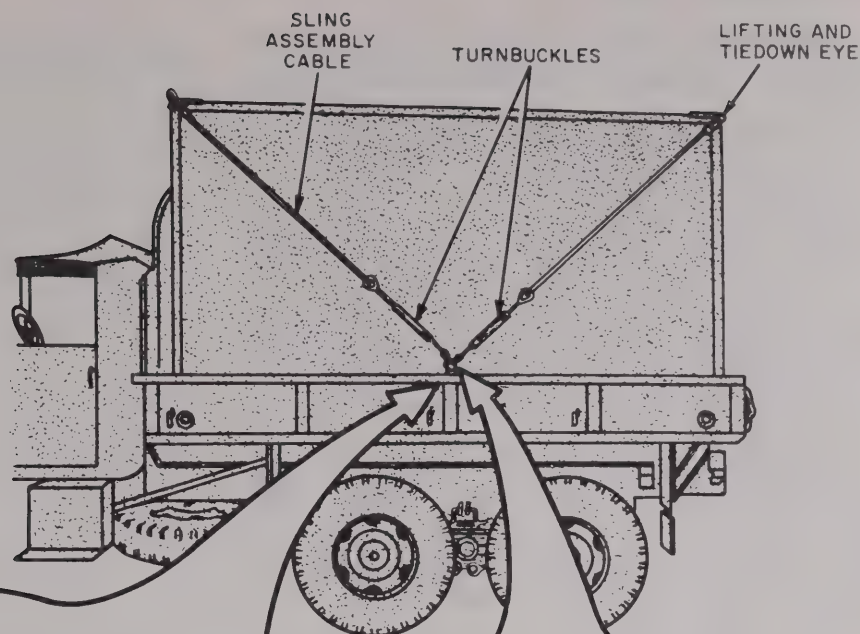
(3) Unwind the power cable assembly and power cable stub from the cable reel.

CAUTION

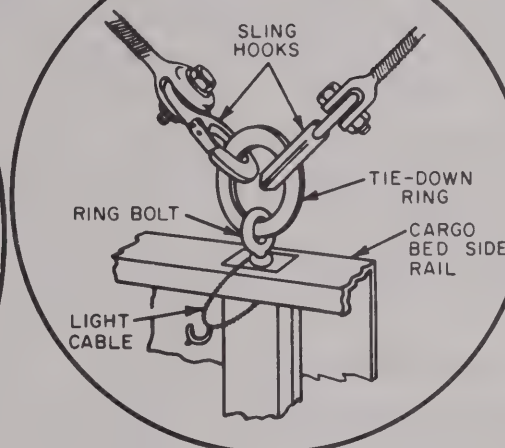
Power for the AN/TRC-117(*) is normally supplied through the POWER 115V AC IN connector. The POWER 115V AC OUT connector is provided to supply power to another assemblage or to supply power to the AN/TRC-117(*) if the POWER 115V AC IN connector is damaged. When the POWER 115V AC OUT connector is used to supply power to another assemblage, do not allow the total current drawn by the AN/TRC-117(*) to exceed 60 amperes, the current rating of the power cable assembly connected to the power source.

b. Connection to PU-618/M.

(1) Remove the covers from one end of the power cable assembly and from the 115V AC POWER IN receptacle in the POWER ENTRANCE BOX (Fig. 1-1), and connect the power cable assembly to the receptacle.



A. EXPLODED VIEW OF TIE-DOWN RING ASSEMBLY.



B. CONNECTIONS FOR SLING ASSEMBLY CABLES TO TIE-DOWN RING.

Figure 2-9. Securing AN/TRC-117(*) on truck.

EL3TT020

NOTE

As an expedient, the 115V AC POWER OUT receptacle may be used to make the connection if the 115V AC POWER IN receptacle is broken.

WARNING

The generator set should be turned off before making any power connections. Look behind the control panel to make sure the power output switch is set to 120V, 1Ø (single phase). Be sure to check both generators.

(2) If the generator set includes an output connector that is compatible with the connector on the power cable assembly, connect the power cable assembly to the generator set; otherwise, refer to the generator set manual (appx A). On the generator set, move the generator OUTPUT SELECTOR switch (located behind the control panel) to 115 vac SINGLE PHASE. Connect the green (or red) power cable stub together with the white neutral lead to L2 (neutral terminal). Connect the black hot lead to L3 (hot terminal). Add a heavy conductor jumper (at least number 6AWG) between L2 (neutral terminal) and trailer GND STUD. Remove this jumper when the power cable is disconnected.

(3) Remove the covers from the power cable assembly and the power cable stub, and connect the stub.

c. Connection to Central Power Source.

WARNING

Turn off or disconnect the central power source before making any connections.

(1) If the power source is a 120 volts, 50 to 60 Hz, single phase, two-wire source, connect the power cable stub red or green lead to the ground terminal, the white lead to the neutral terminal, and the black lead to the hot (phase) terminal.

(2) If the power source is 110/220 volts, 50 to 60 Hz, single-phase or 2-phase, 3-wire distribution system, connect the power cable stub red or green lead to the ground terminal, the white lead to the neutral terminal, and the black lead to either of the two, hot (phase) terminals.

(3) If the power source is a 110/220 volts, 50 to 60 Hz, 3-phase, 4-wire distribution system, connect the power cable stub red or green lead to the ground terminal, the white lead to the neutral bus bar, and the black lead to either of the three hot (phase) bus bars.

(4) Remove the covers from the power cable stub and from the cable assembly and connect the power cable stub to one end of the power cable assembly. Connect the other end of the power cable assembly to the POWER 115V AC IN receptacle in the POWER AND SIGNAL ENTRANCE BOX.

2-9. Cable and Signal Connections

All external antenna and pcm connections are made through the receptacles in the VIDEO & ANTENNA ENTRANCE BOX on the roadside wall of the assemblage. Telephone line connections are made through the POWER & SIGNAL ENTRANCE BOX on the rear wall of the assemblage.

a. Antenna Cable Connections (fig. 1-11).

(1) Remove the cover from the SYSTEM 1 or SYSTEM 2 antenna receptacles as appropriate, and from the free end of the antenna cable.

(2) Attach the antenna cable to the appropriate antenna receptacle. Check to see that no kinks or sharp bends are in the antenna cable.

(3) Slide the strain relief cable grip up toward the connector and attach the snap hook to the cable support eye next to the connector. The cable grip should take all strain off the connector. Then attach the cable grip to the cable support eye next to the antenna receptacle in the VIDEO & ANTENNA ENTRANCE BOX.

b. Pcm Cable Connections (fig. 1-11). Connect Cable, Special Purpose, Electrical CX-4245/G or

CX-11230/G to the paired SYSTEM 1 or SYSTEM 2 IN and OUT receptacles as follows:

NOTE

Adapter, Cable Assembly CX-10734/G is required for connecting between the CX-11230/G cable and the system connectors on the VIDEO & ANTENNA ENTRANCE BOX on shelters which do not have the new (SINGLE) PCM cable receptacle.

(1) Slip a cable grip (supplied with cable) through a lifting and tiedown eye or other convenient tiedown point on the assemblage or truck.

(2) Attach the male and female connectors on the CX-4245/G or CX-11230/G (plus adapter if required) to the IN and OUT receptacles in the VIDEO & ANTENNA ENTRANCE BOX and hand tighten them by turning the polyethylene sleeve on the female connectors.

(3) Wrap the cable grip on the video cable far enough from the connectors to form a loose loop after the video cable is connected to the SYSTEM IN & OUT receptacles.

c. Twenty-Six Pair Cable Connection Procedures (fig. 1-10).

(1) Unlock and remove the covers from the receptacles in the SIGNAL ENTRANCE PANEL and from the 26-pair cable assembly.

(2) Insert the cable connector into the assemblage receptacles and secure them by closing the lock collars.

(3) Operate the associated BINDING POST—CABLES switches (fig. 1-6) on the interior of the assemblage to the CABLES (down) position.

(4) If the required cable distance exceeds 250 feet, couple two 26-pair cable assemblies together.

NOTE

Do not connect more than six 26-pair cable assemblies together. A decrease in signal quality will be experienced.

d. Field Wire Connection Procedure.

(1) Connect the two-wire telephone pairs or the telephone send pairs (black or green) of a four-wire telephone circuit to the 2WT/R binding posts in the SIGNAL ENTRANCE BOX (fig. 1-10) associated with the desired channel.

(2) Connect the telephone receive pairs (white or gray) of the four-wire telephone circuit to the 4 WT binding posts associated with the same channel.

(3) Operate the associated BINDING POST—CABLES switches (fig. 1-6) to the BINDING-POST position (up).

2-9.1. Use and Installation of Wideband Transformer

a. Use. A wideband transformer and cable assembly must be installed in the AN/TRC-117(*) if communications are to be established with other radio terminal sets (AN/TRC-110(V) and AN/TRC-117(*)) which have been modified to use this transformer or with a AN/GRC-151(V) or a AN/GRC-152(V).

b. Installation. A kit consisting of four wideband transformers (NSN 5950-01-101-6700) and four cable assemblies (NSN 5995-01-135-2273) is required for installation. To install the transformers proceed as follows:

(1) Disconnect the rf cables from the TO RADIO XMTR connectors on each TD-202/U.

(2) Using the cable assemblies supplied with the kit, connect one end of a wideband transformer to the TO RADIO XMTR connector on each TD-202/U as indicated in figure 2-9.1.

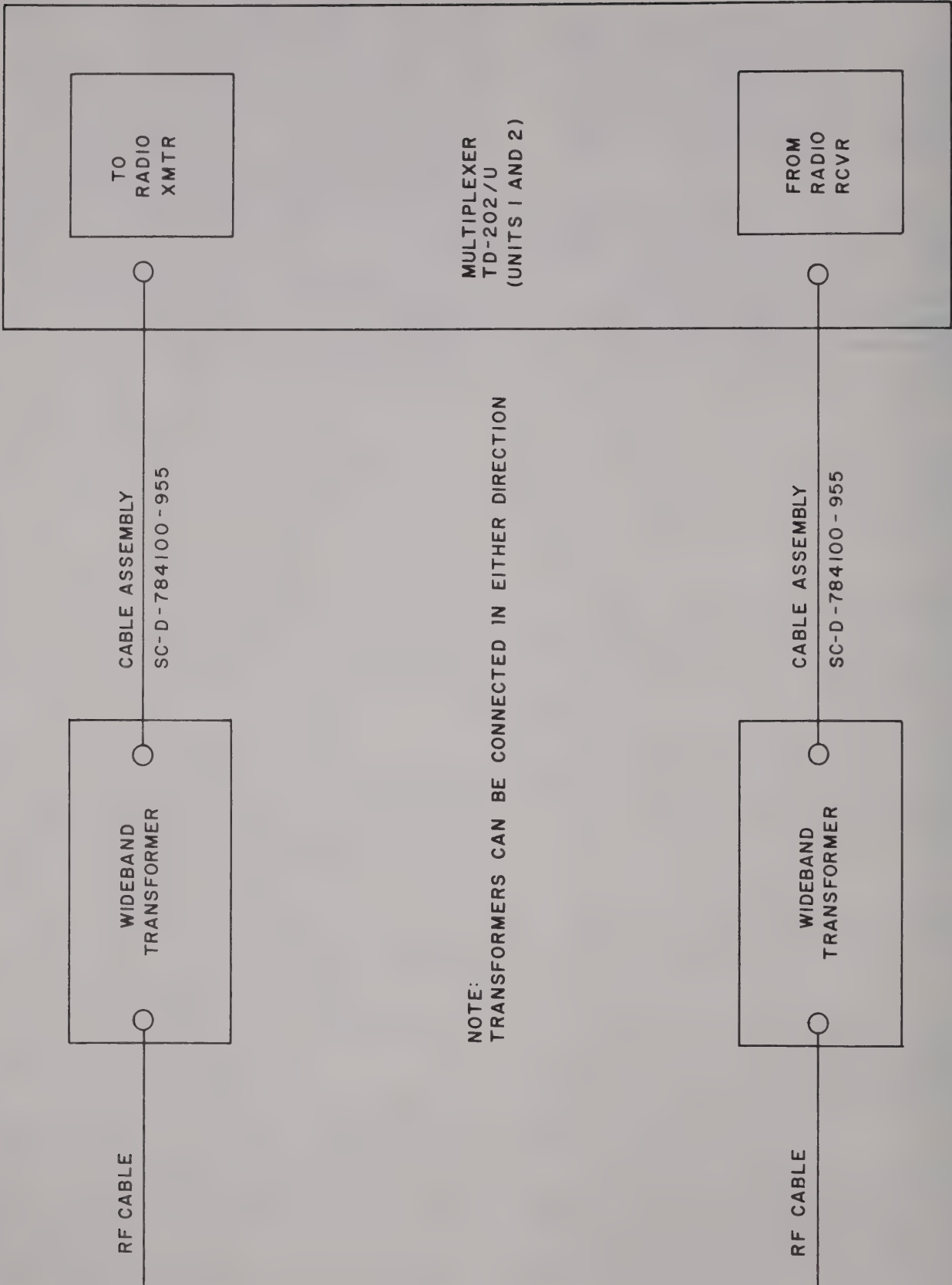
(3) Reconnect the rf cables disconnected in (1) above to the other end of the wideband transformers.

(4) Disconnect the rf cables from the FROM RADIO RCVR connectors on each TD-202/U.

(5) Using the cable assemblies supplied with the kit, connect one end of a wideband transformer to the FROM RADIO RCVR connector on each TD-202/U.

(6) Reconnect the rf cables disconnected in (4) above to the other end of the wideband transformers.

(7) Dress the cables as required.



EL3TT103

Figure 2-9.1. Installation of Wideband Transformers.

2-10. Interunit Cable Connections

The components of AN/TRC-117(*) may be connected to provide a variety of terminal or repeater configurations. Some interunit connections remain the same in all applications and are shown connected in figure FO-4 for assemblages without a patch panel and in figure FO-6 for the later B model shelters that have a patch panel installed. The connections peculiar to each configuration are shown in the illus-

tration for the configuration as listed in table 2-1. Determine the application requirements for the AN/TRC-117, and make the appropriate direct and patch panel connectors as indicated.

NOTE

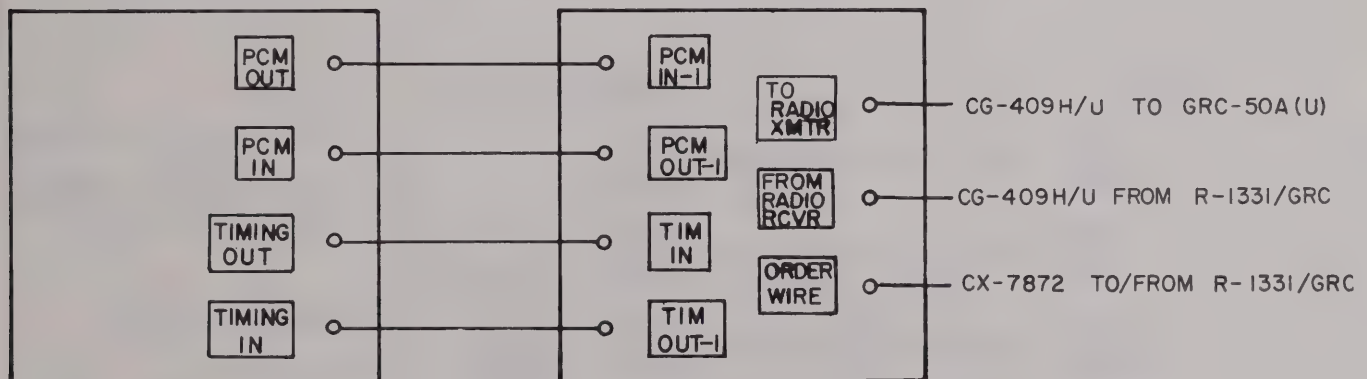
When remote drop and insert is used, DO NOT exceed a 5-mile distance from the repeater to the drop and insert terminal.

Table 2-1. Interunit Cable Connections

| System Configuration | Without Patch Panel | | With Patch Panel | |
|---|---------------------|--------|----------------------|------------------------------|
| | Figure Number | | Figure Number | |
| | Nonsecure | Secure | Interunit connection | Patching diagram |
| 12-channel radio terminal | 2-10 | 2-57 | 2-20 | 2-28 |
| 24-channel radio terminal | 2-11 | 2-58 | 2-23 | 2-29 |
| 12-channel cable terminal | 2-12 | 2-59 | 2-20 | 2-30 |
| 24-channel cable terminal | 2-13 | 2-60 | 2-23 | 2-31 |
| 12-/24-channel cable to/from radio conversion | 2-14 | | 2-14 | 2-32 |
| 12-/24-channel radio repeater | 2-15 | | 2-15 | 12-chan 2-33 24-chan 2-34 |
| 24-channel radio repeater with local drop and insert | 2-16A | 2-16B | 2-26 | 2-35 |
| 24-channel radio repeater with remote drop and insert | 2-17 | | 2-17 | 2-36 |
| 12-/24-channel cable repeater | 2-18 | | 2-18 | 2-37 |
| 24-channel cable repeater with 12-channel drop and insert | 2-29A | 2-19B | 2-27 | 2-38 |

TD-352/U(1)

TD-202/U(1)



NOTES:

1. INDICATES EQUIPMENT MARKING
2. ALL CONNECTING CABLES ARE CG-1040 B/U UNLESS OTHERWISE SPECIFIED.

EL3TT021

Figure 2-10. Radio terminal, nonsecure 12-channels, interunit connection diagram.

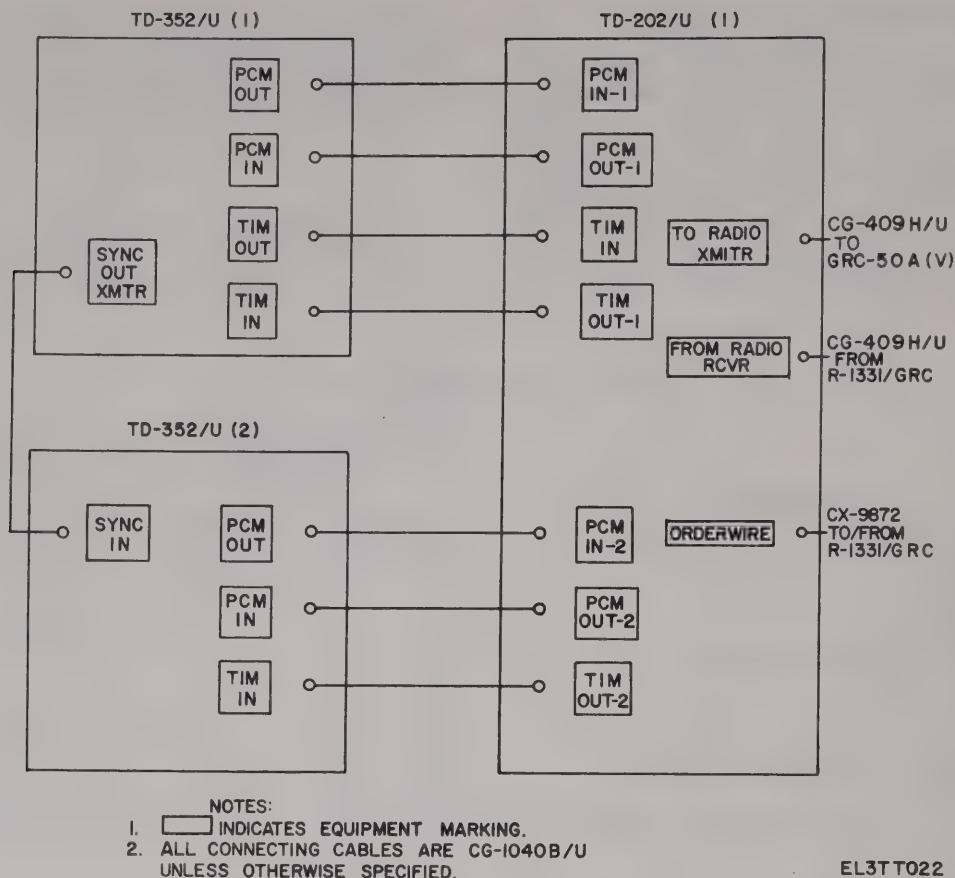


Figure 2-11. Radio terminal, nonsecure 24-channels, interunit connection diagram.

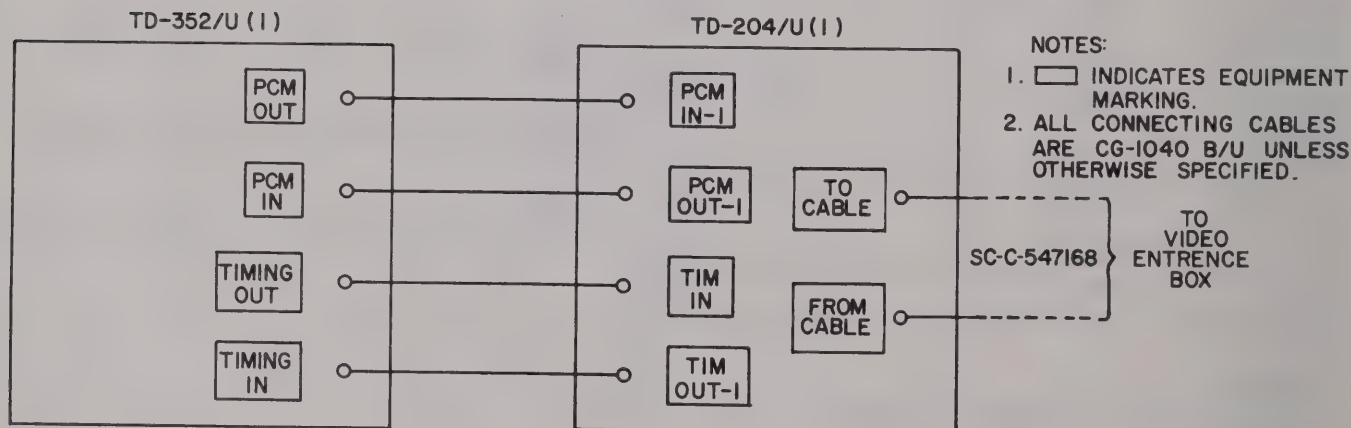
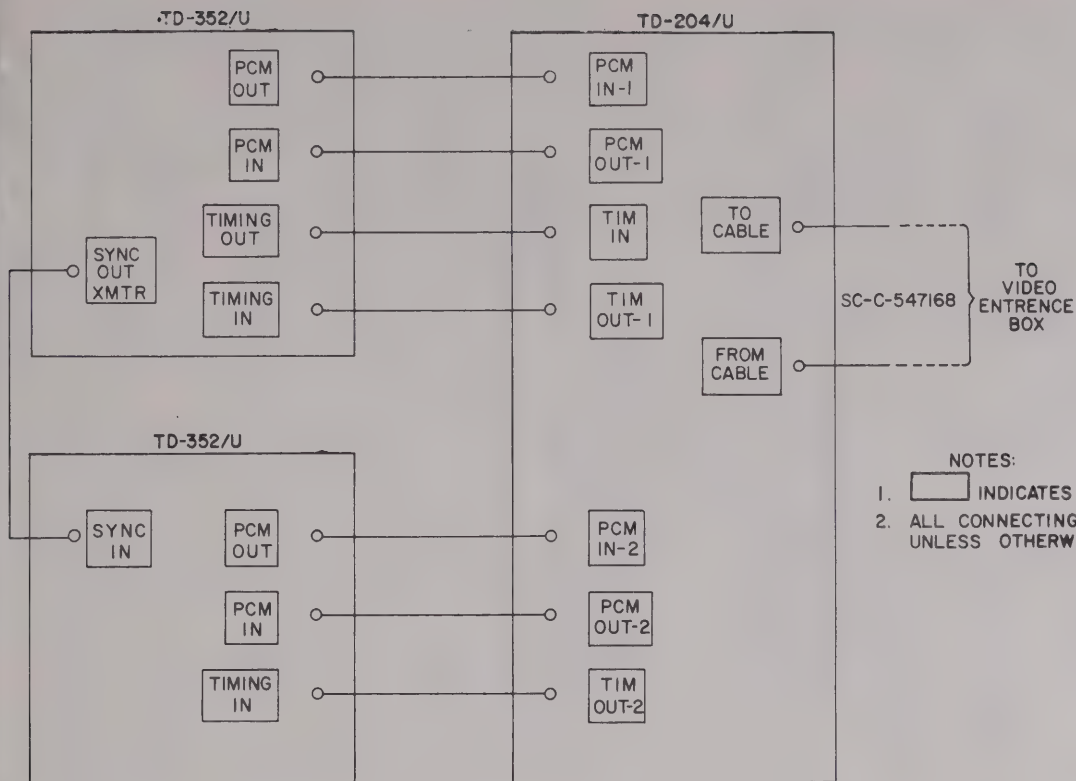
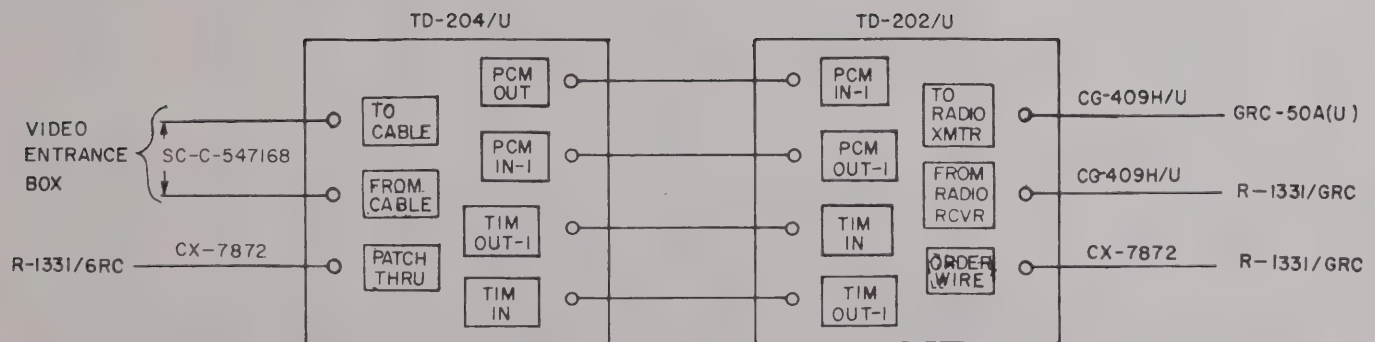


Figure 2-12. Cable terminal, nonsecure 12-channels, interunit connection diagram.



EL3TT024 ■

Figure 2-13. Cable Terminal, Nonsecure 24-channels,
Interunit Connection Diagram.



NOTES:

1. INDICATES EQUIPMENT MARKING.
2. ALL CONNECTING CABLES ARE CG-1040B UNLESS OTHERWISE SPECIFIED.

EL3TT025

Figure 2-14. Cable-to-Radio Conversion, 12/24-channels,
Interunit Connection Diagram.

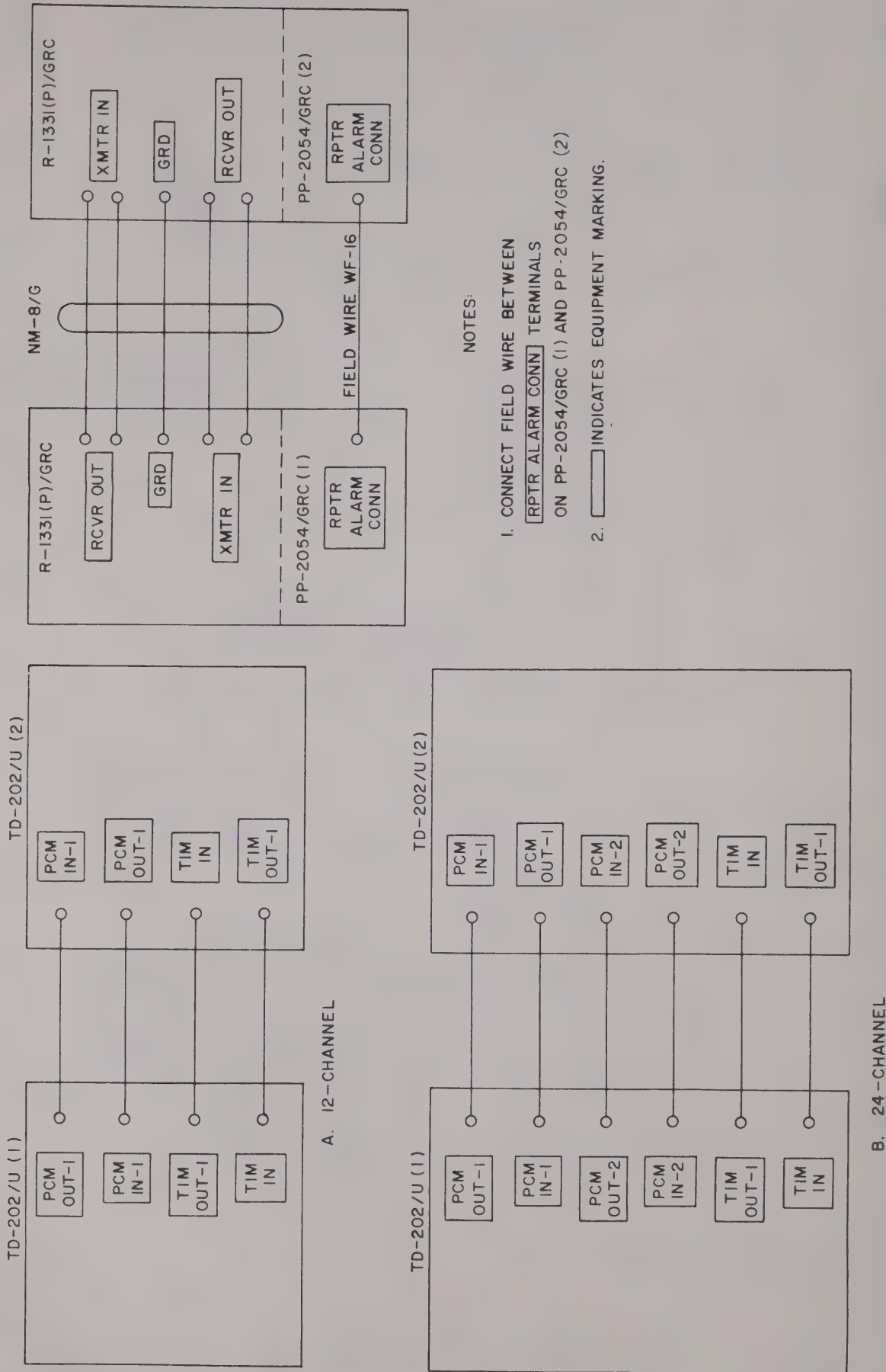
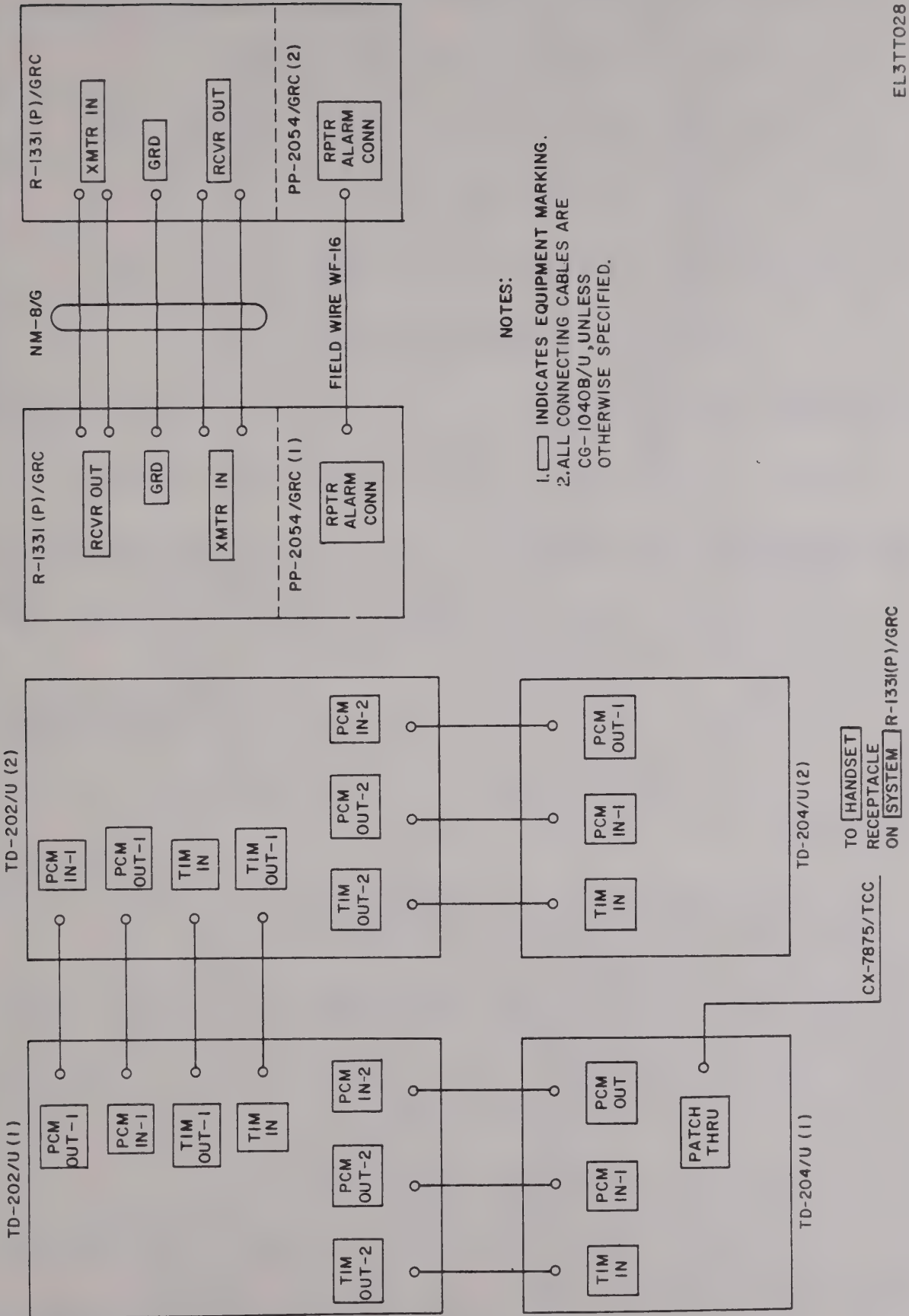
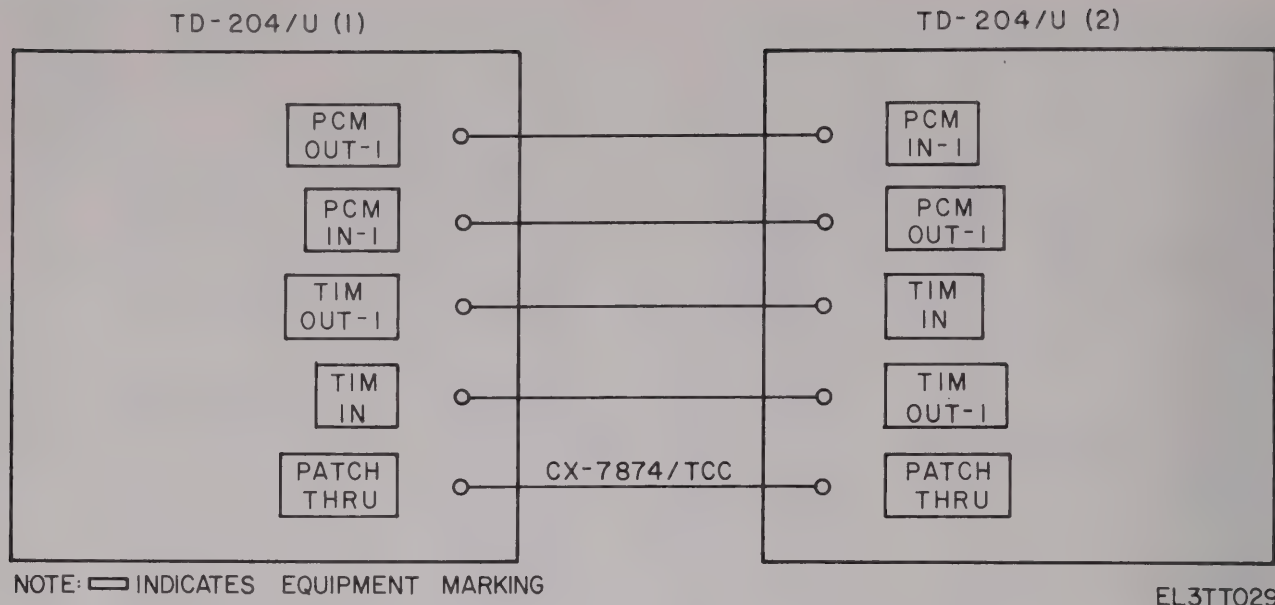


Figure 2 15. Radio repeater, 12/24-channels, interunit connection diagram.



EL3TT028

Figure 2-17. Radio repeater, 24-channels with remote drop and insert via cable extension, interunit connection diagram.



EL3TT029

Figure 2-18. Cable repeater, 12/24/48-channels, interunit connection diagram.

2-11. Installing and Connecting TSEC/KG-27 (Security Equipment)

a. *General.* The TSEC/KG-27 is required for secure operations but is not supplied with the assemblage. The AN/TRC-117(*) can provide secure link communications when TSEC/KG-27 is interconnected into the system. Unkeyed equipment may be left unattended if it is protected to a degree which, in the judgement of the commander, is sufficient to preclude any reasonable chance of theft, sabotage, tampering, or access by unauthorized persons. Paragraphs 7-3 and 7-4 (C) TB 380-41 pertain.

b. TSEC/KG-27 Preinstallation Procedures.

(1) Open the right side permutter door (receiver) on the front panel by unscrewing the latch knob located on the front of the door.

(2) Pull the tray lock lever out until the permutter tray is released, and remove the permutter tray from the holder.

(3) Hold the permutter tray with the handle to the left so that the letters run from left to right.

(4) Program the permutter using the stylus, move each slider to the numerical position specified for the crypto period.

(5) Insert the permutter tray into the permutter assembly. Swing the lock lever up until it just touches the zeroizing plunger near the top of the assembly.

(6) Close and secure the permutter access door.

(7) Repeat (1) through (6) above for the transmit permutter.

(8) For additional information pertaining to the TSEC/KG-27 preliminary checkout and turn-on procedures, refer to KAM 258 ()/TSEC. For additional information on the permutter, refer to KAO-133()/TSEC.

NOTE

For secure operation with the TSEC/KG-27, the TD-352/U AUX switch must be in the IN position.

c. *Installation and Checkout Procedures (A Version).*

(1) If the TD-352/U and TD-202/U are connected for nonsecure operation, turn power switches to OFF position and disconnect the cables between the two components.

WARNING

To prevent a TEMPEST hazard, disconnect Telephone Set TA-312/PT.

(2) Remove the six cables (five signal and one power) from the TSEC/KG-27 Installation Kit.

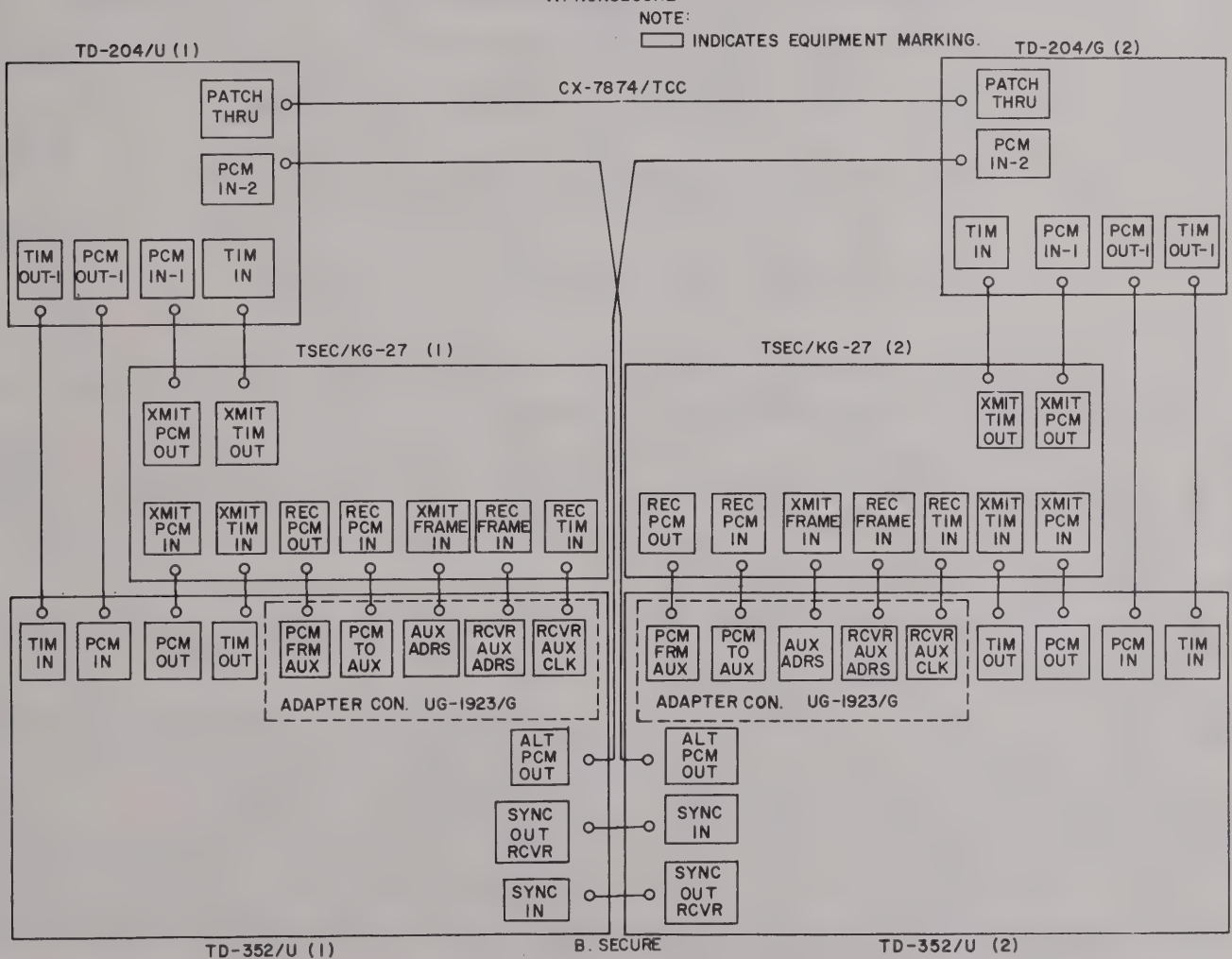
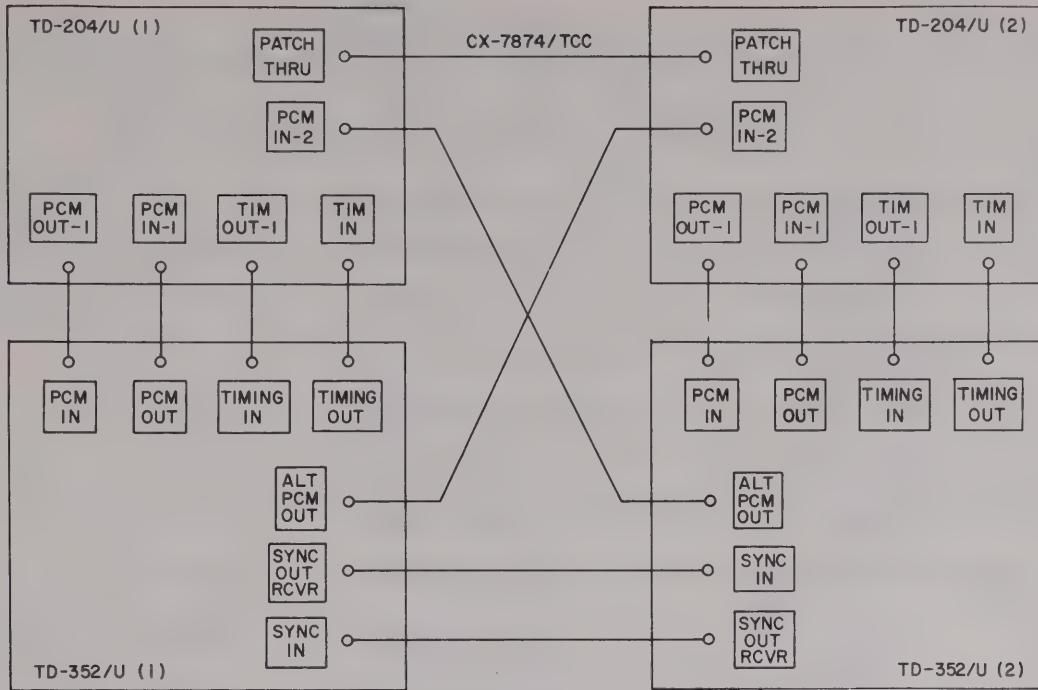
(3) Connect Adapter Connector UG-1923/G to the TD-352/U AUX IN connector.

(4) Connect cables for a loopback check as indicated in figure 2-39.

(5) Connect the power cable between the TSEC/KG-27 and the appropriate outlet.

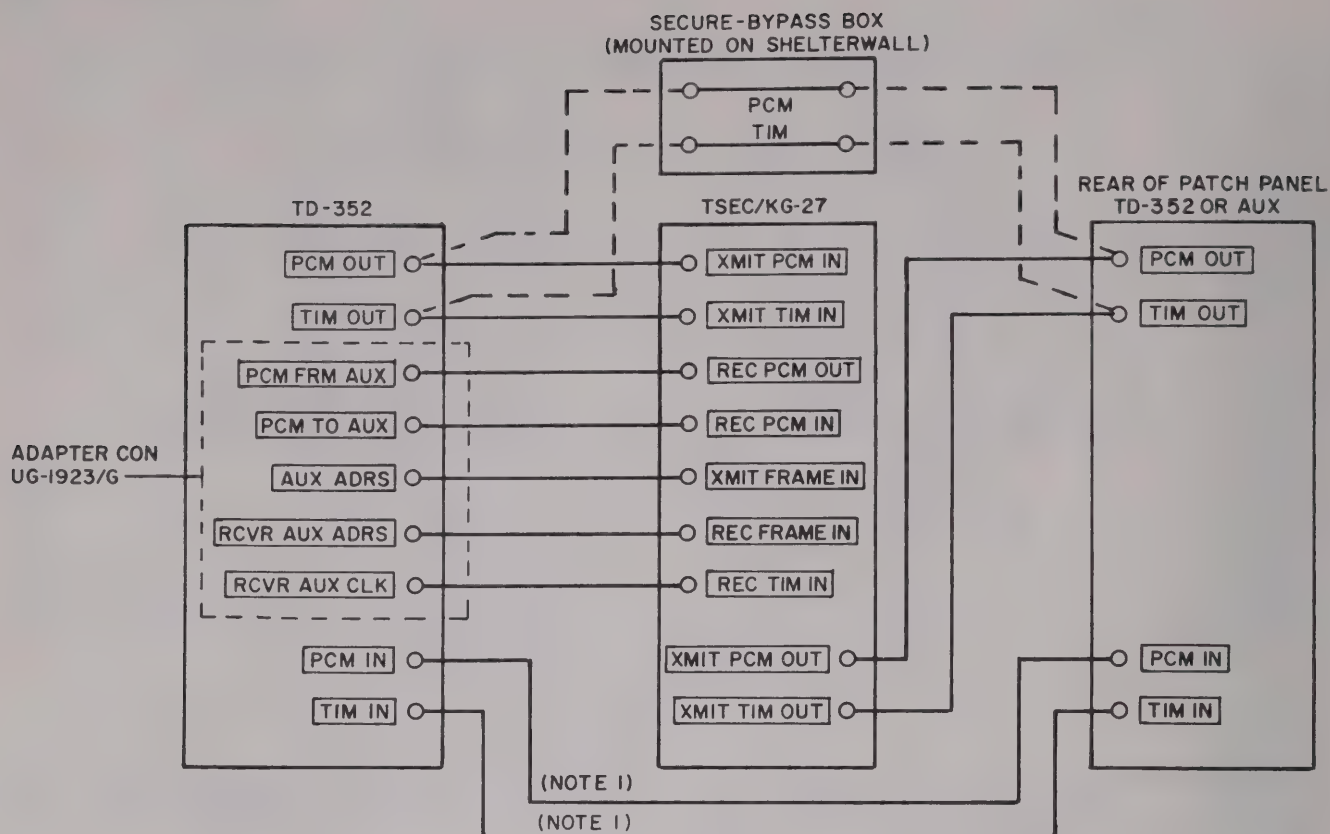
(6) Place the power switches of the TD-352/U and TSEC/KG-27 to the ON position.

(7) Rotate the TSEC/KG-27 monitor select switch to all positions; ensure that the monitor lamp



EL3TT030

Figure 2-19. Cable repeater, nonsecure and secure 24-channels with 12-channel drop and insert, interunit connection diagram.

**NOTE:**

THESE CABLES ARE PART OF THE SHELTER WIRING AND ARE ALREADY CONNECTED.

EL3TT081

Figure 2-20. Terminal, secure 12-channels, interunit connection diagram.

lights and no alarm condition exists. The multiplexers frame and no visible or audible alarm condition exists. If performance is satisfactory, place the power switches of the TD-352/U and TSEC/KG-27 to the OFF position, disconnect the cabling hookup and continue with the installation procedure.

(8) Identify the end of each cable labeled TD-352/U and TD-202/U. Connect this end of each cable to the proper connector on the TD-352/U and TD-202/U.

(9) Route the free ends of the cables along the walls behind the equipment to the back of the TSEC/KG-27 equipment racks.

(10) Slide the TSEC/KG-27's part way into its assigned space in the rack. Connect the free end of each cable to its correct connector on the rear of the TSEC/KG's (KAM 258A/TSEC/KG-27).

NOTE

If TSEC/KG's are received with mounting bracket installed, remove the brackets and store for future use.

d. Installation and Checkout Procedures (B Version).

(1) If the TD-352/U and TD-202/U are connected for nonsecure operation, turn power switches to OFF and disconnect the cables between the two components.

WARNING

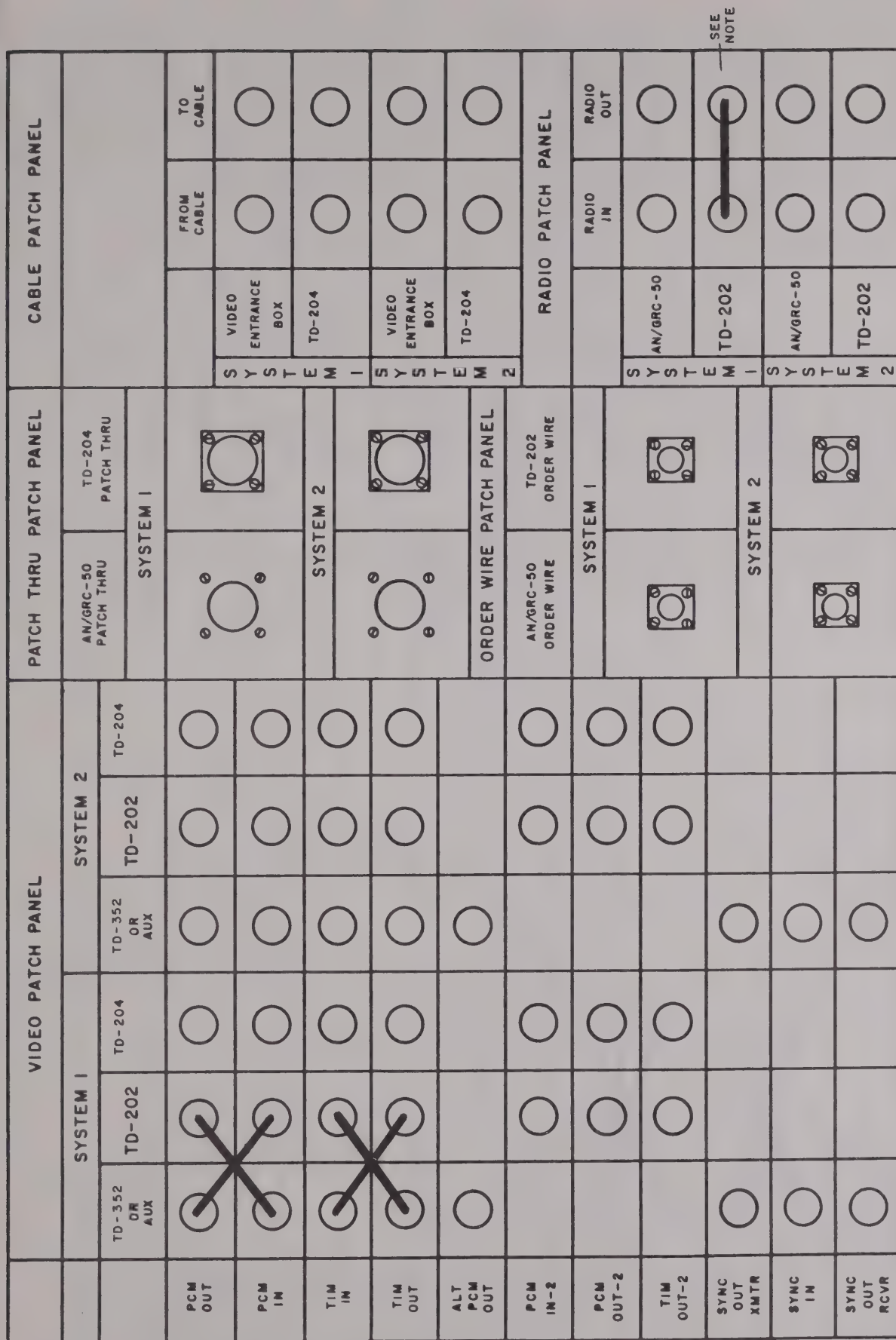
To prevent a TEMPEST hazard, disconnect Telephone Set TA-312/PT.

(2) Remove the six cables (five signal and one power) from the TSEC/KG-27 installation kit.

(3) Connect Adapter Connector UG-1923/G to the TD-352/U AUX IN connector.

(4) Connect cables for a loopback check as indicated in figure 2-20 for each TD-352/U and patch as shown in figure 2-21 (12-channel). Connect cables as shown in figure 2-23 and patch as in figure 2-24 for 24-channel.

(5) Connect the power cable between the TSEC/KG-27 and the appropriate outlet.



NOTE:

REMOVE CG-409/U OF THE TD-202/U FROM THE (TO RADIO XMTR JACK) AND INSTALL ON TEST OUT JACK. PLACE OPR-TEST SWITCH TO TEST.

Figure 2-21. Patch panel connections, terminal, secure 12-channels, interunit connection diagram.

EL3TT098

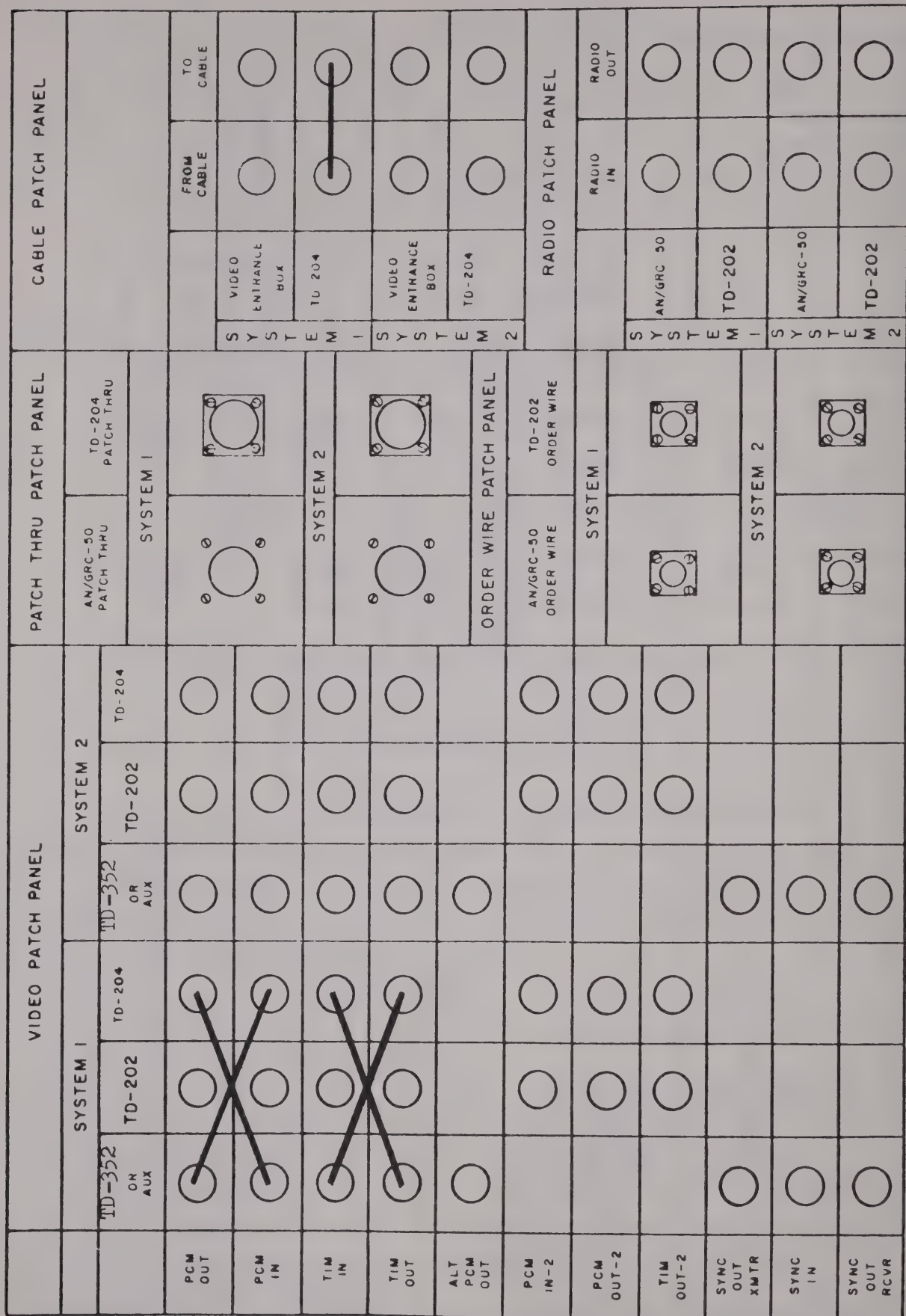
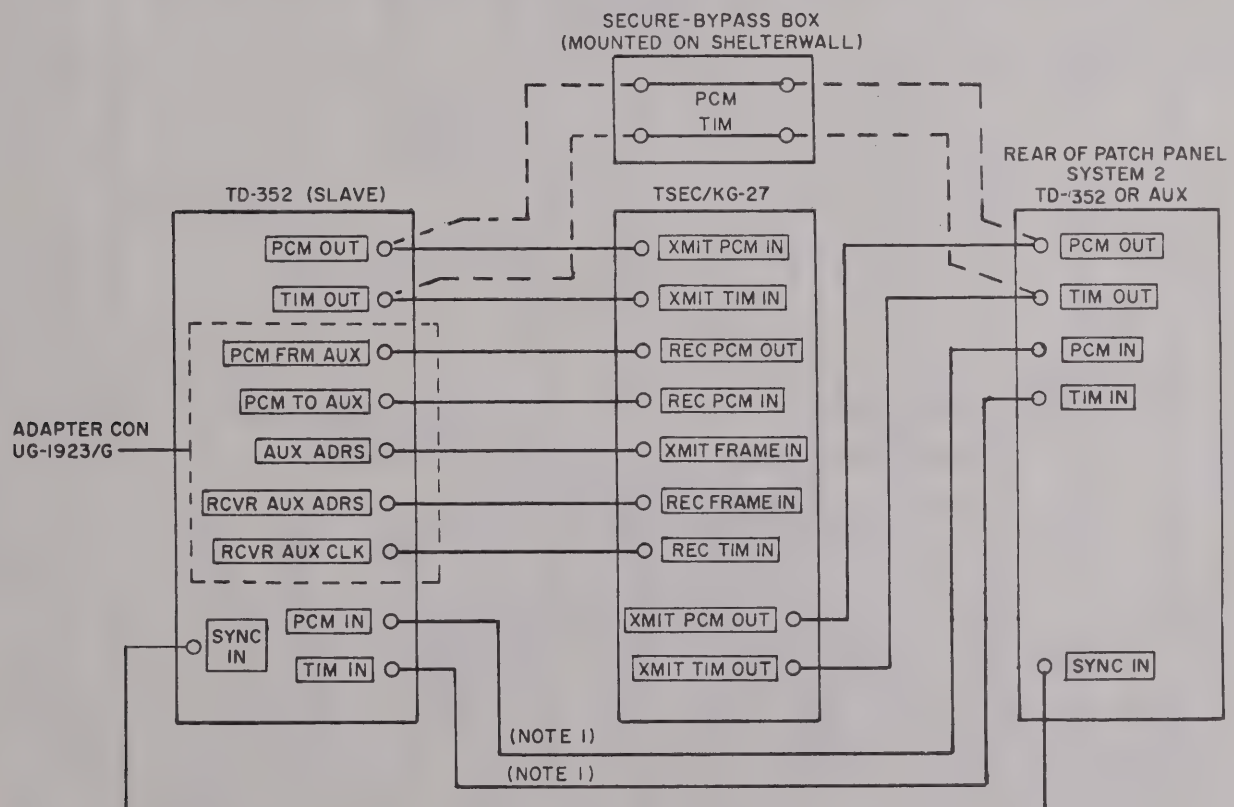
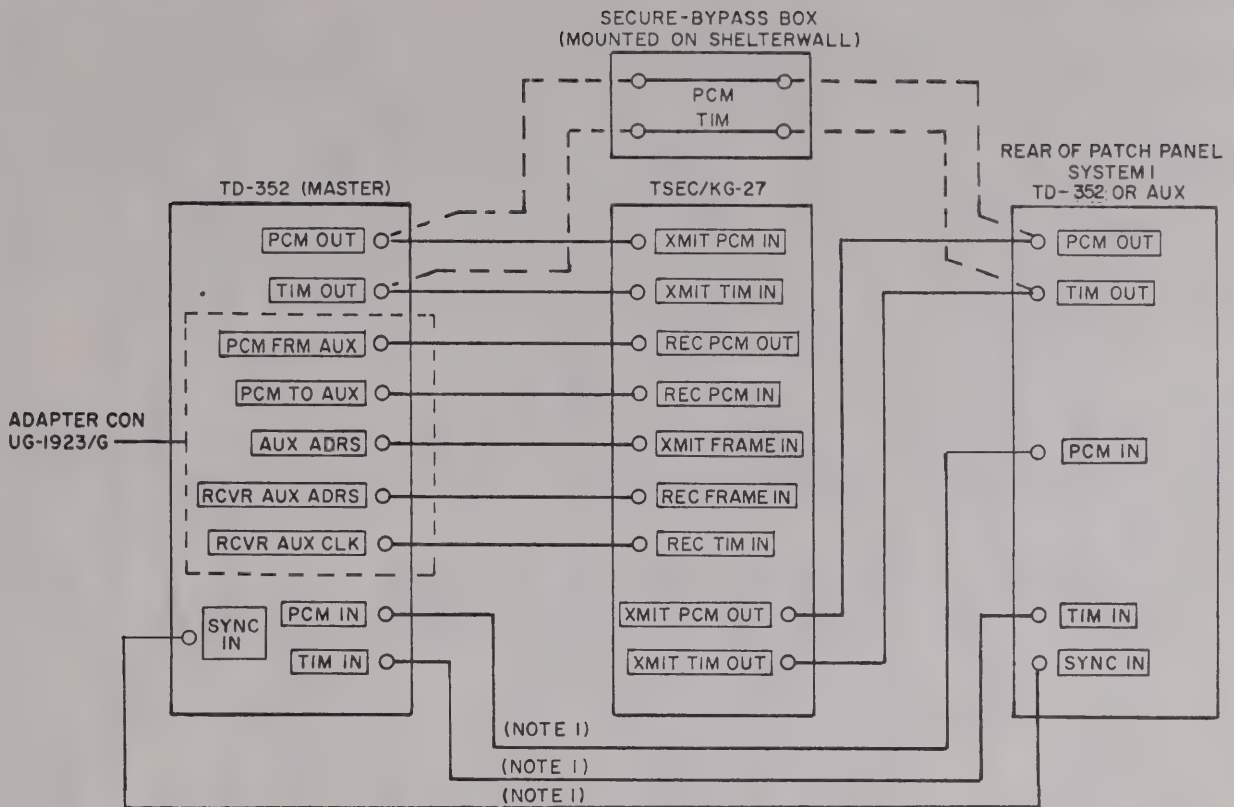


Figure 2-22. Patch panel connections, cable terminal, 12-channels TD-204 loopback.

EL3T099

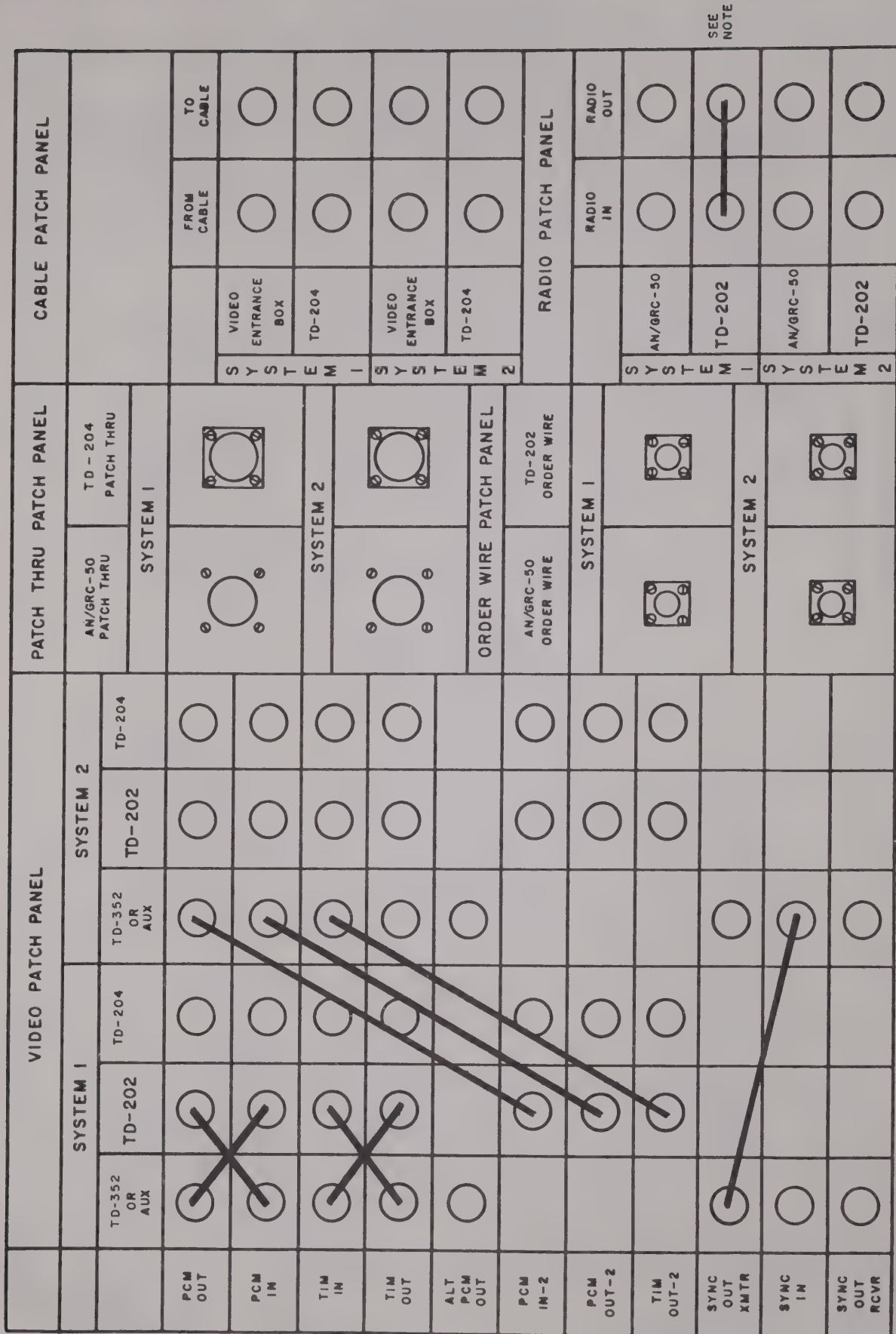


NOTES:

1. THESE CABLES ARE PART OF THE SHELTER WIRING AND ARE ALREADY CONNECTED.

EL3TT082

Figure 2-28. Terminal, secure 24-channels, interunit connection diagram.



NOTE:

NOTE:
REMOVE CG-409/U OF THE TD-202/U FROM THE (TO RADIO XMTR JACK)
AND INSTALL ON TEST OUT JACK. PLACE OPR-TEST SWITCH TO TEST.

EL3TT100

Figure 2-24. Patch panel connections, secure 24-channels, interunit connection diagram.

EL3TTIOI

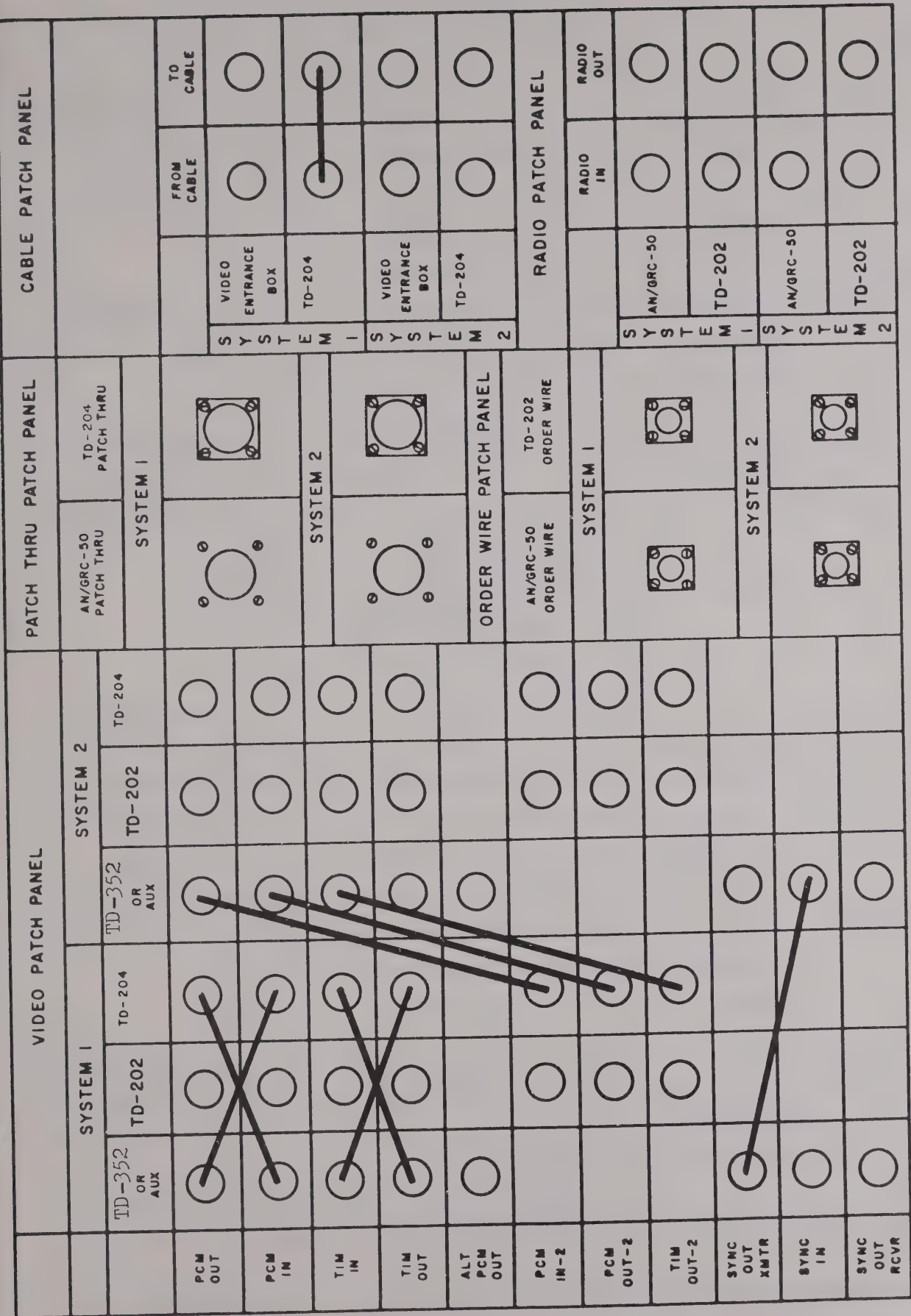
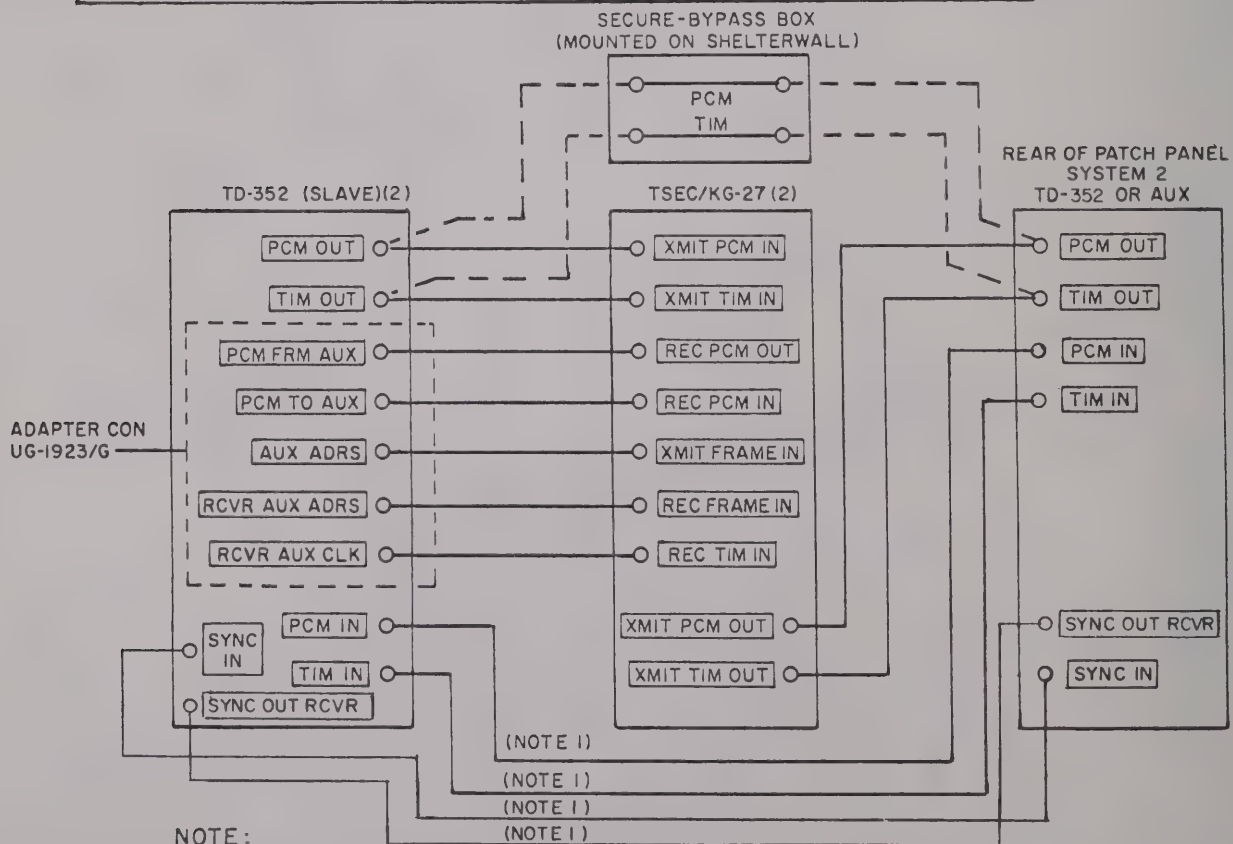
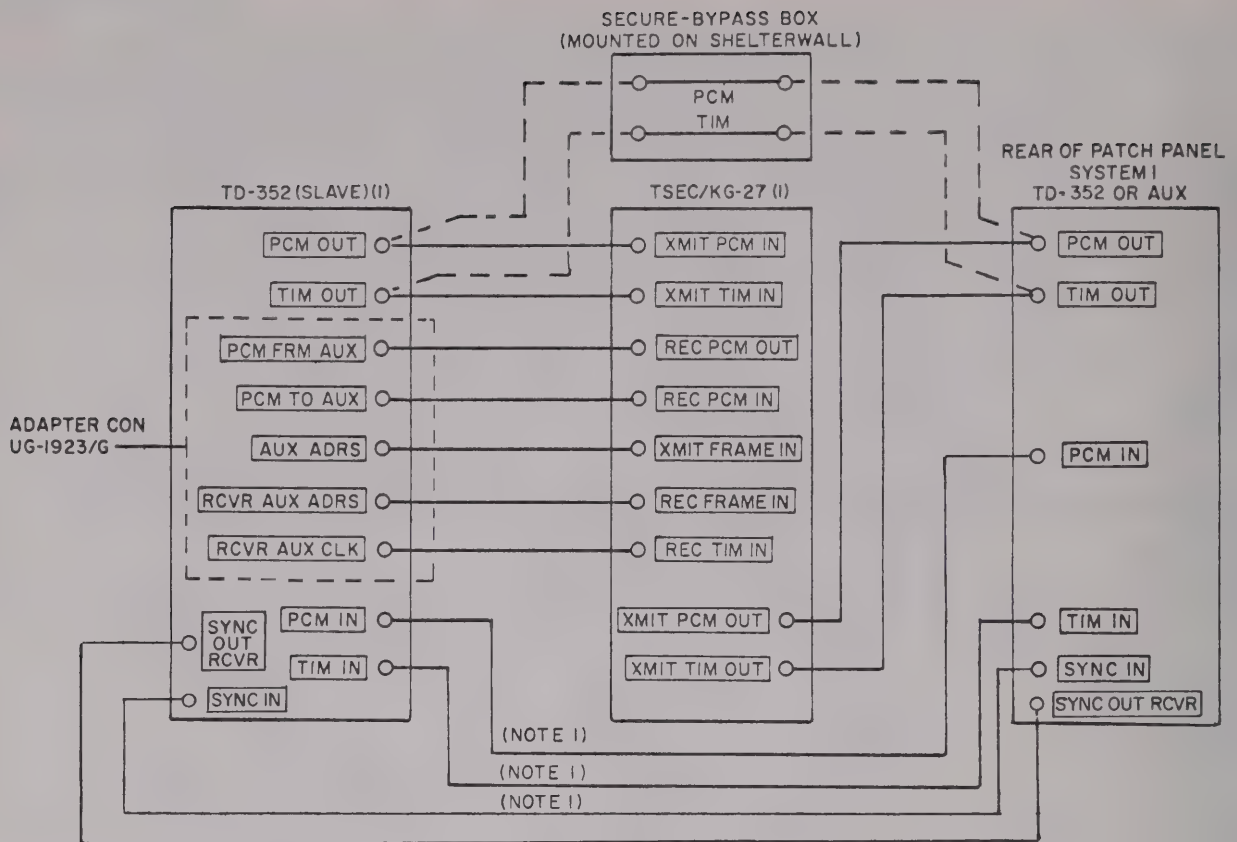
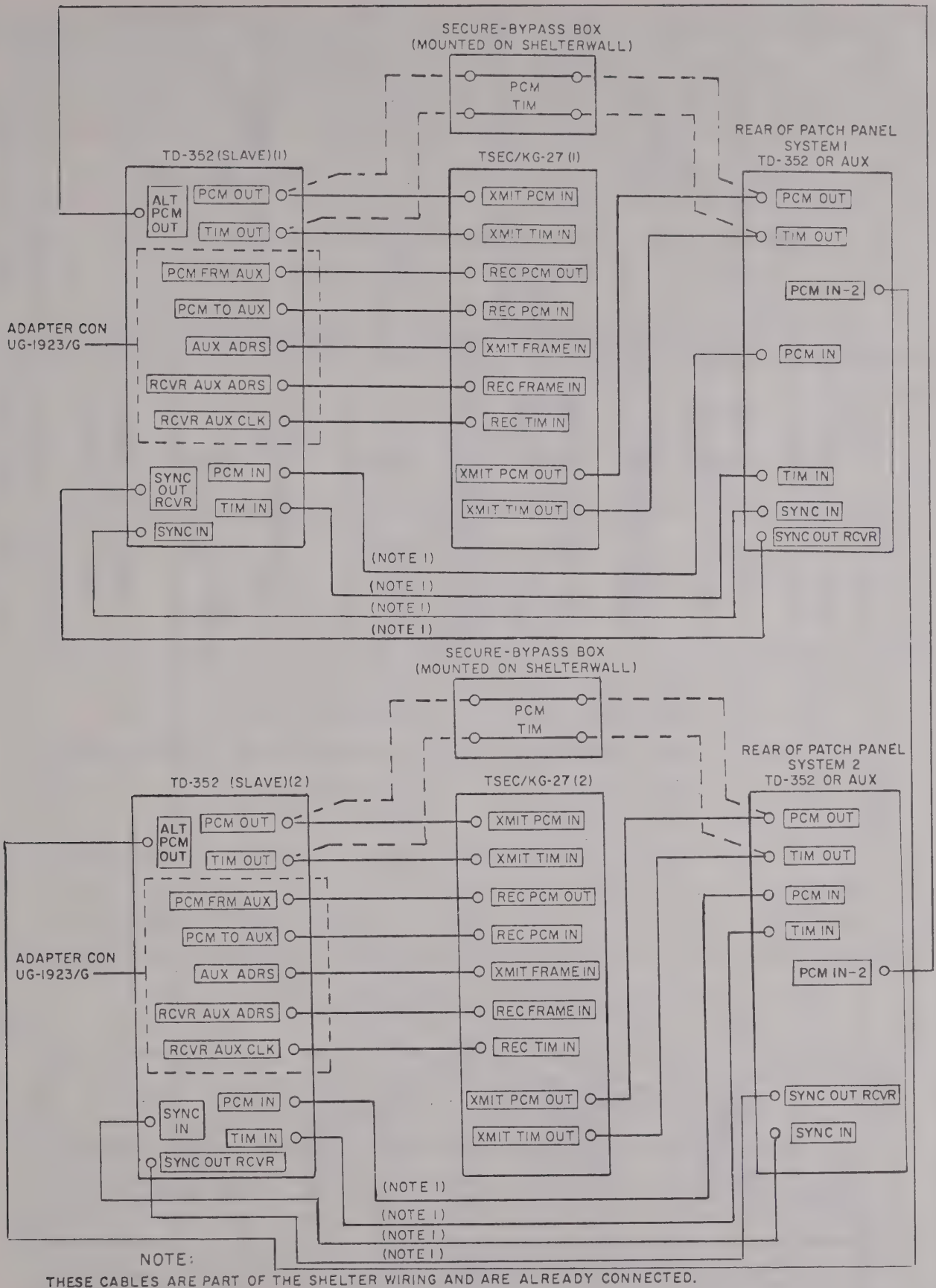


Figure 2-25. Patch panel connections, cable terminal, 24-channels TD-204 loopback.



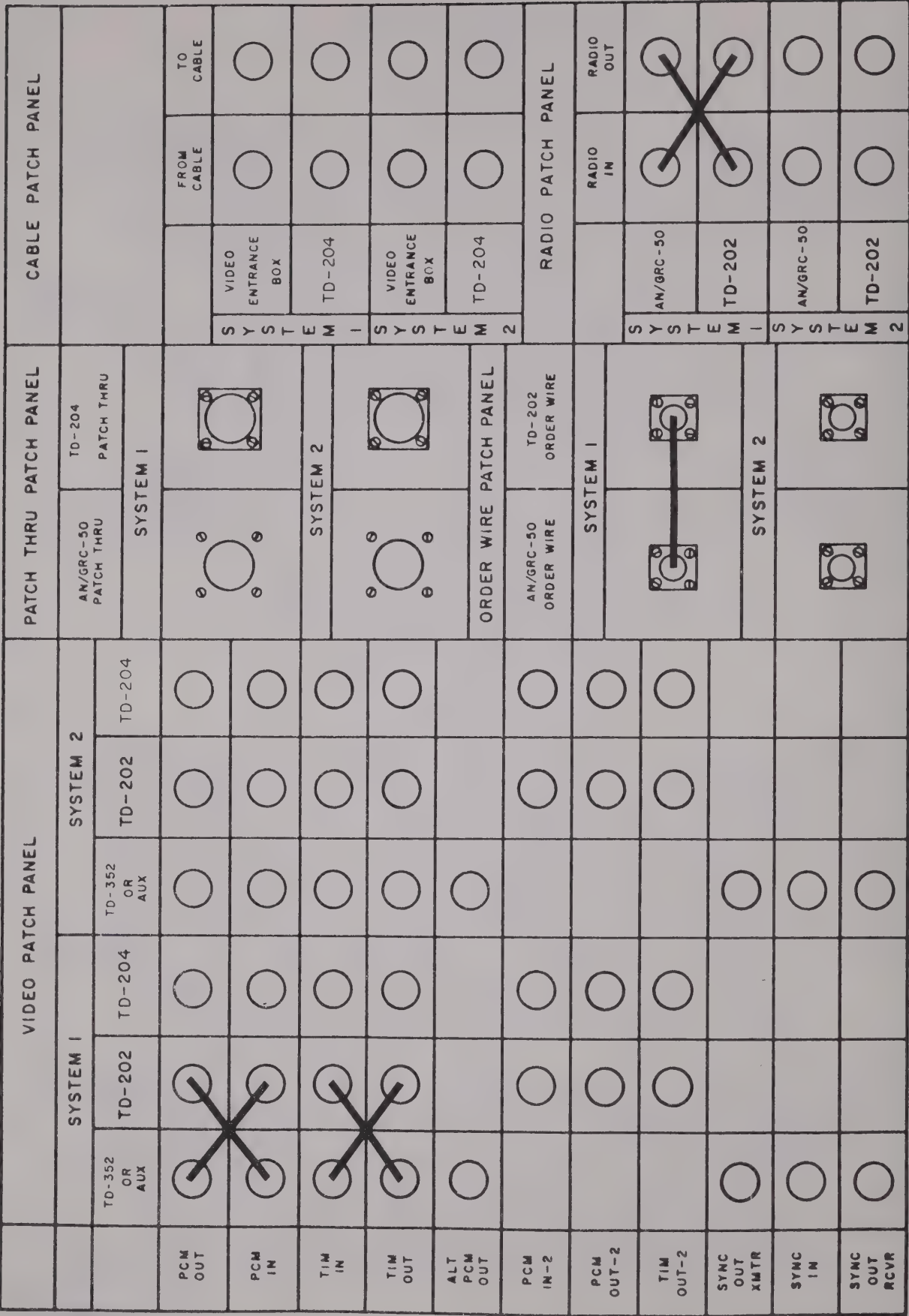
EL3TT083

Figure 2-26. Radio repeater/relay, secure 24-channels with 12-channel drop and insert, interunit connection diagram, B version.



EL3TT084

Figure 2-27. Cable repeater, secure 24-channels with 12-channel drop and insert, interunit connection diagram, B version.



EL3TT085

Figure 2-28. Patch panel connections for radio terminal, 12-channels, interunit connection diagram.

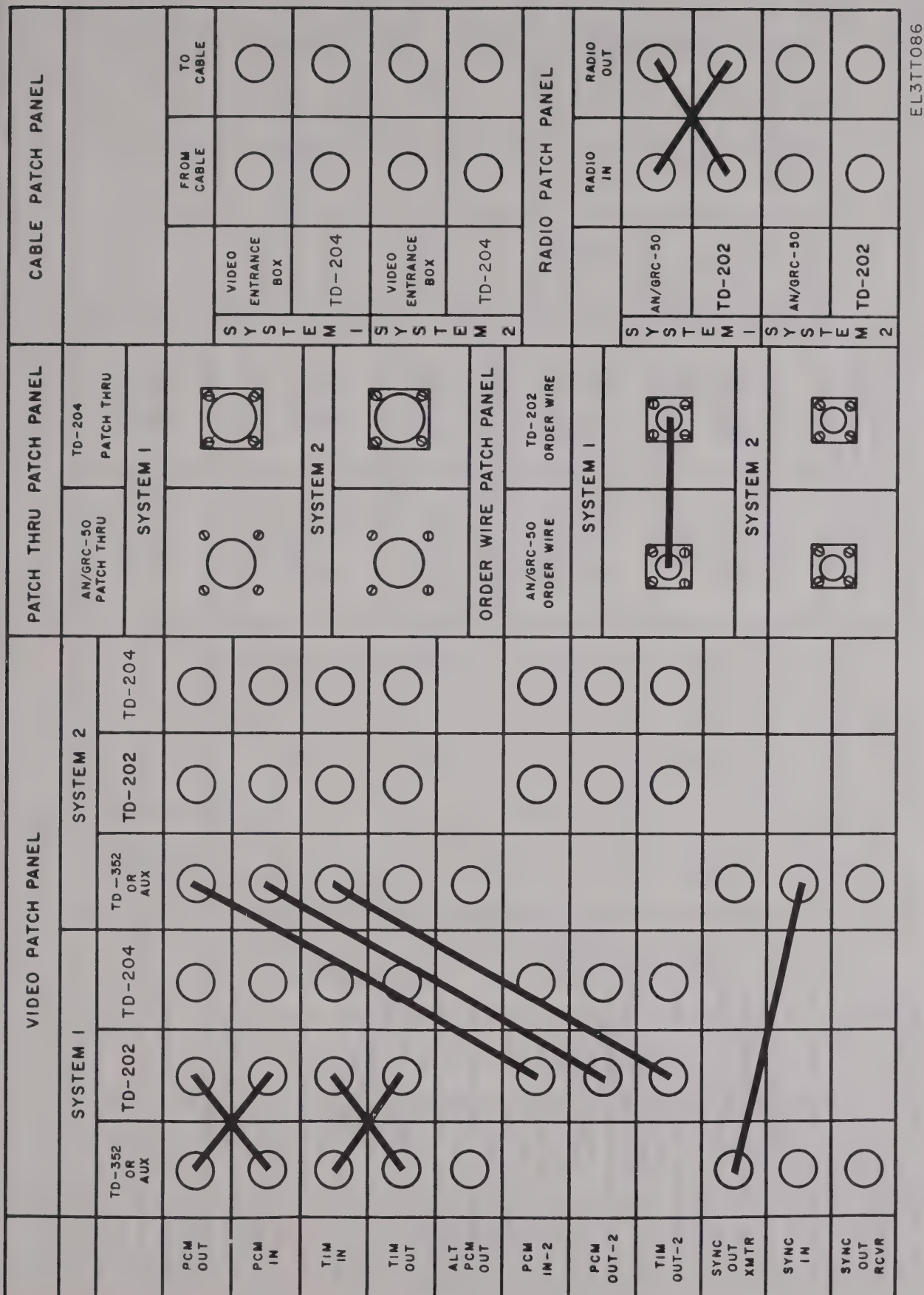
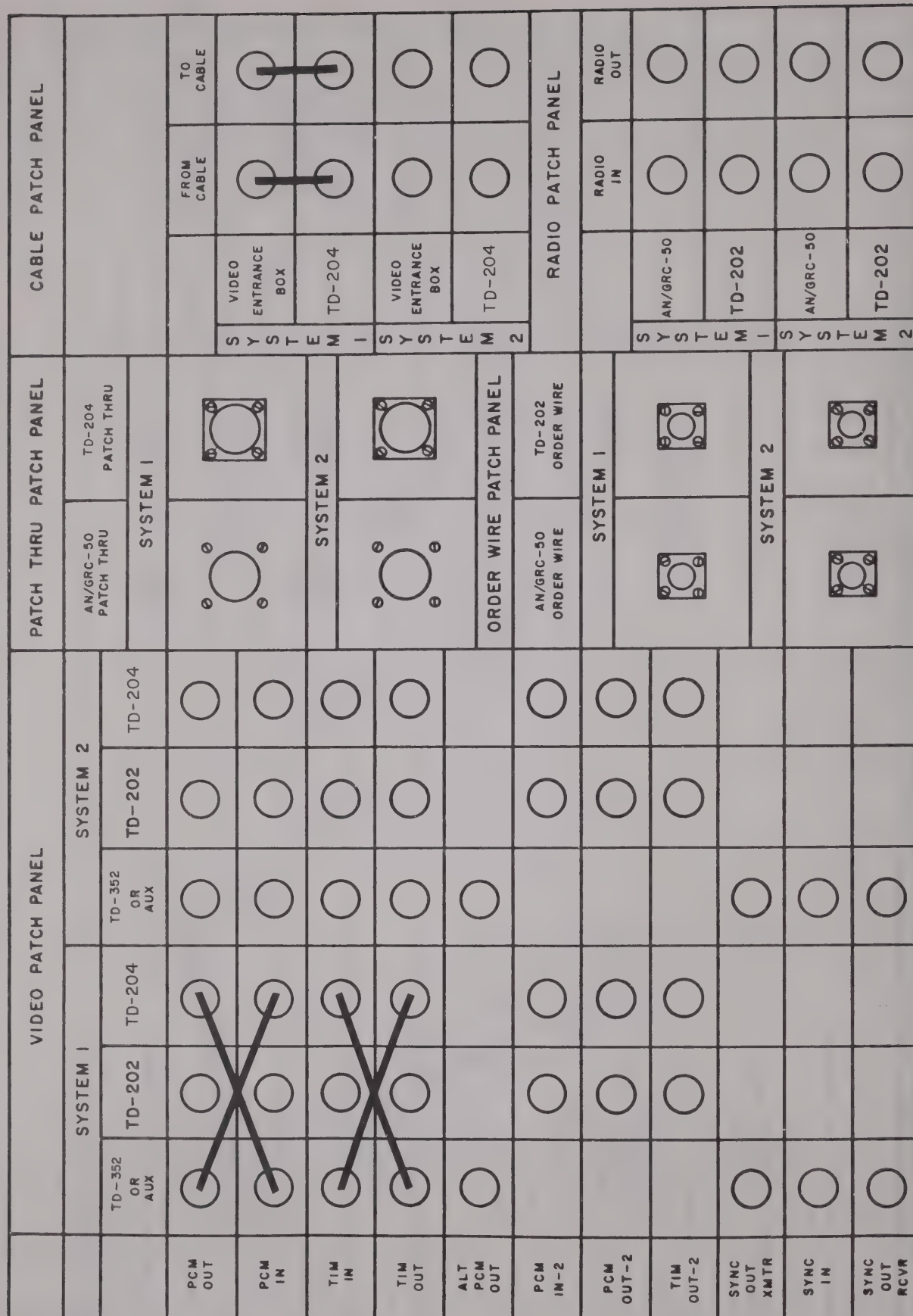
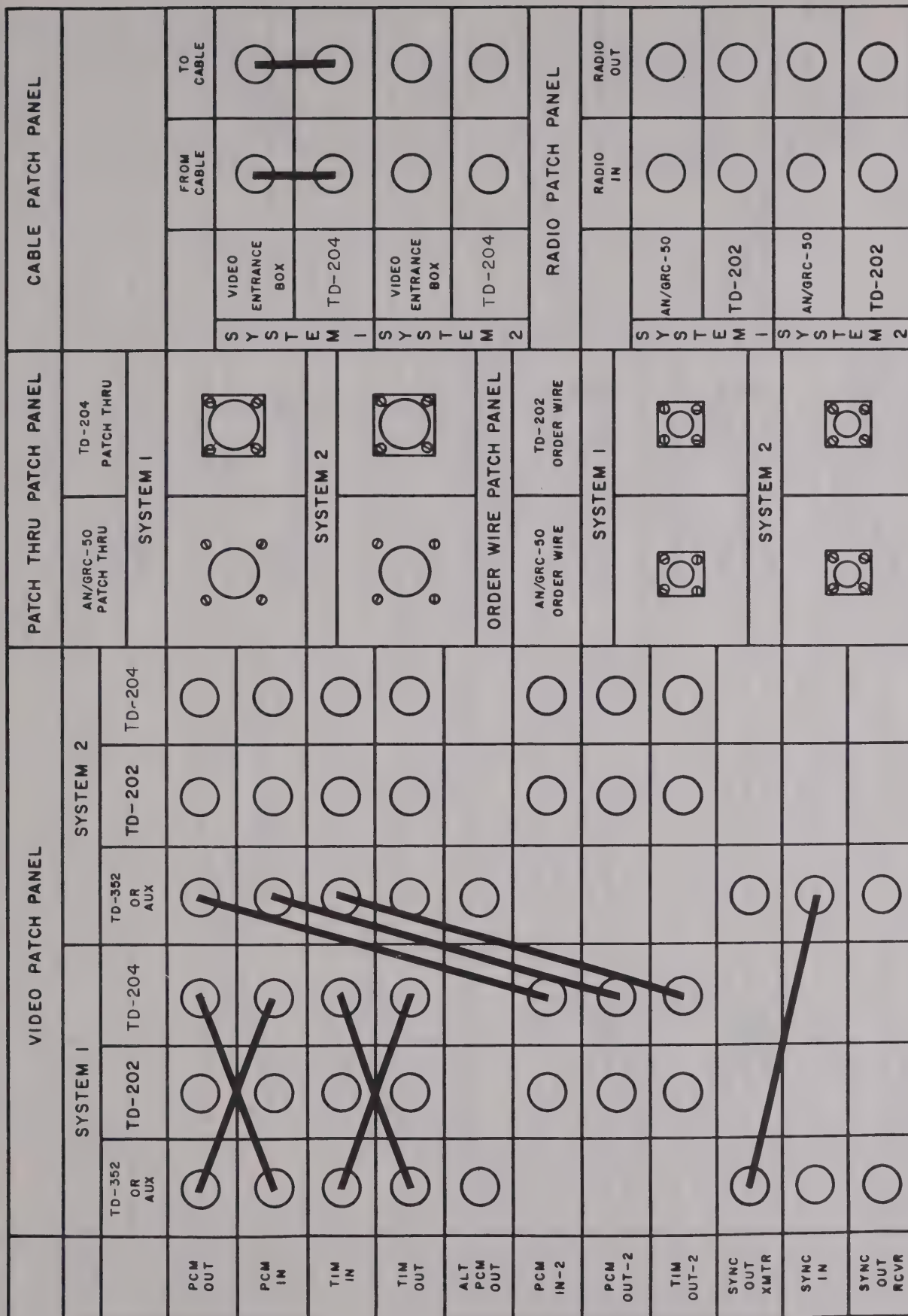


Figure 2-29. Patch panel connections for radio terminal, 24-channels, interunit connections diagram.



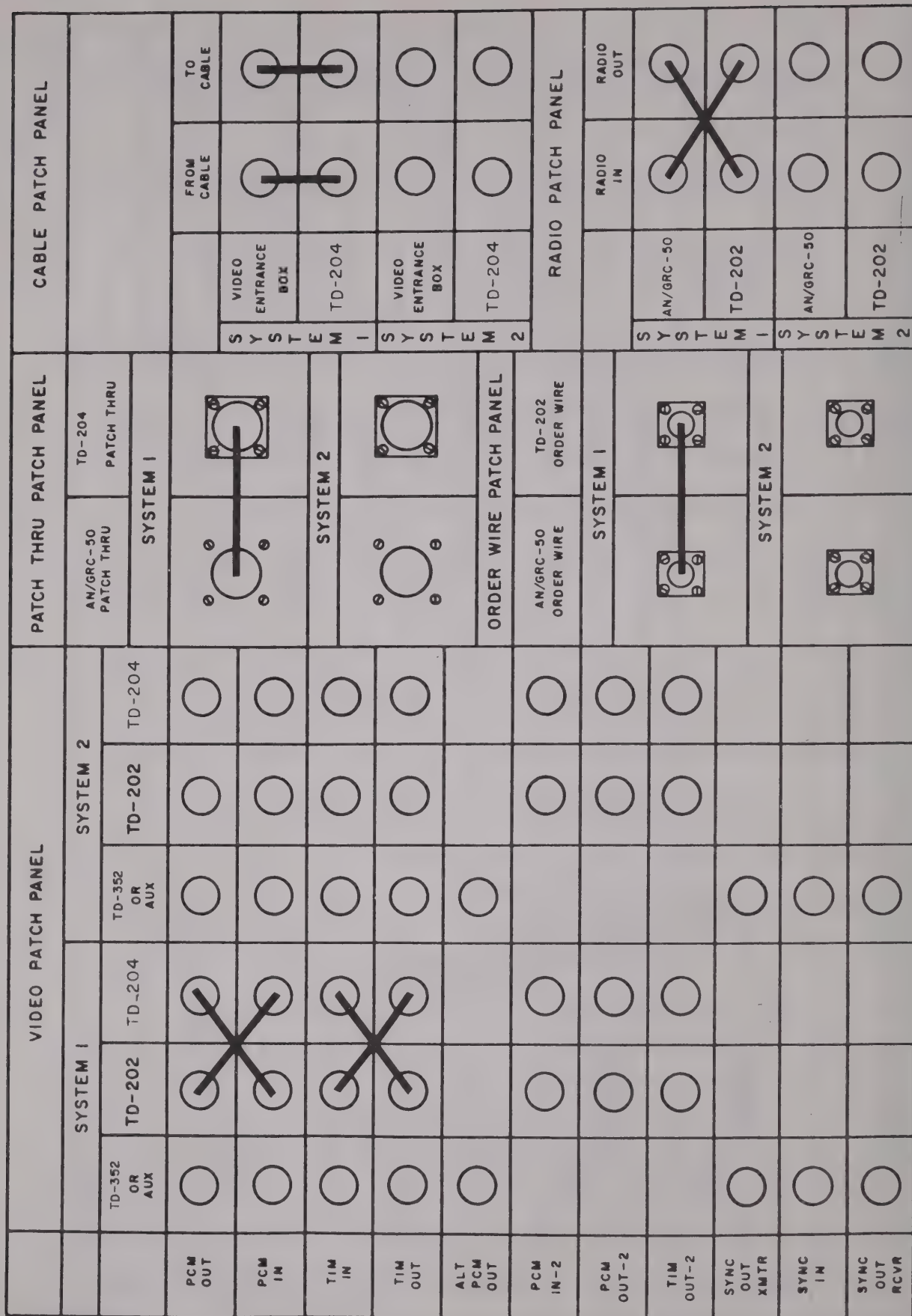
EL3TT087

Figure 2-30. Patch panel connections for cable terminal, 12-channels, interunit connection diagram.



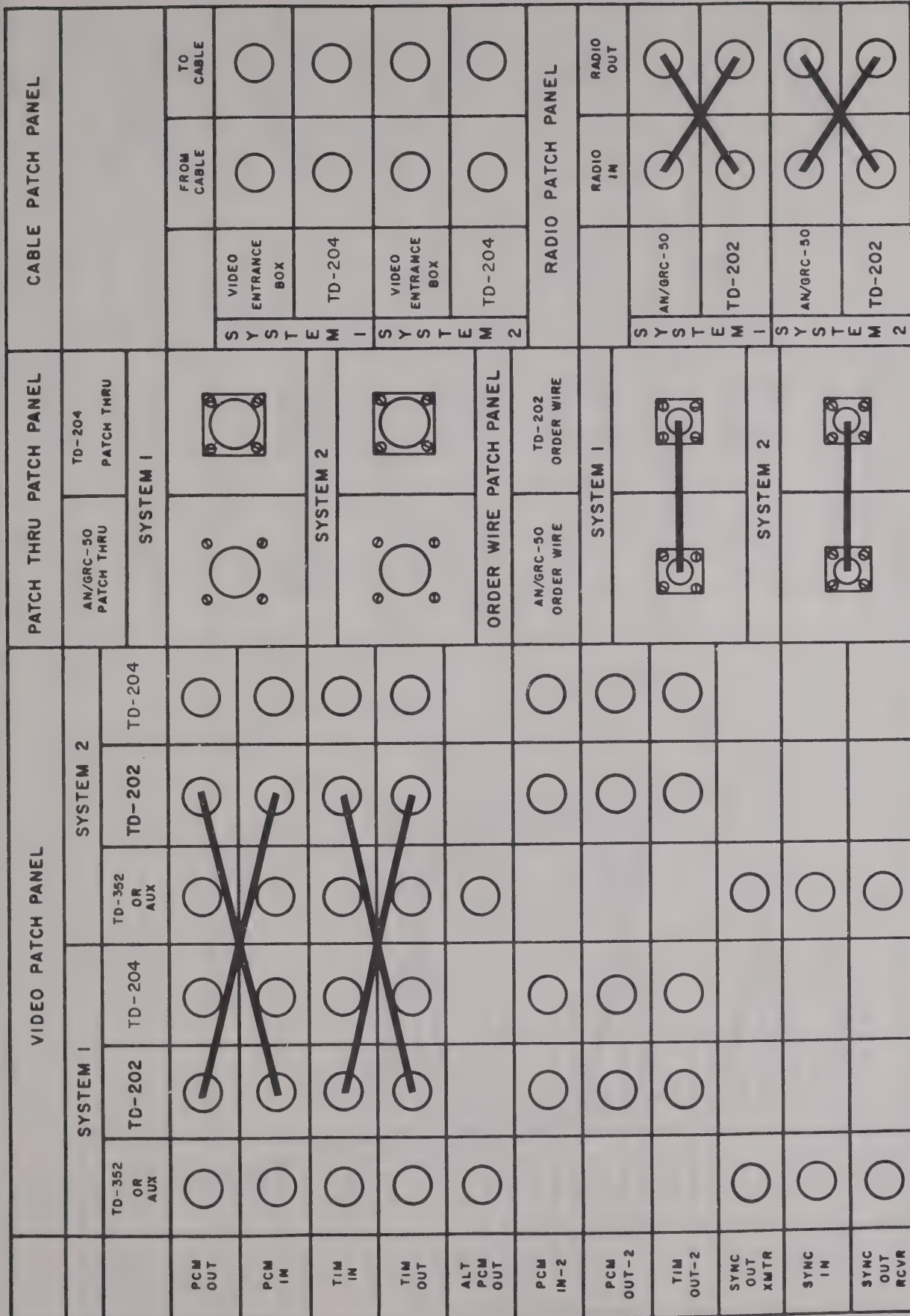
EL3T088

Figure 2-31. Patch panel connections for cable terminal, 24-channels, interunit connection diagram.



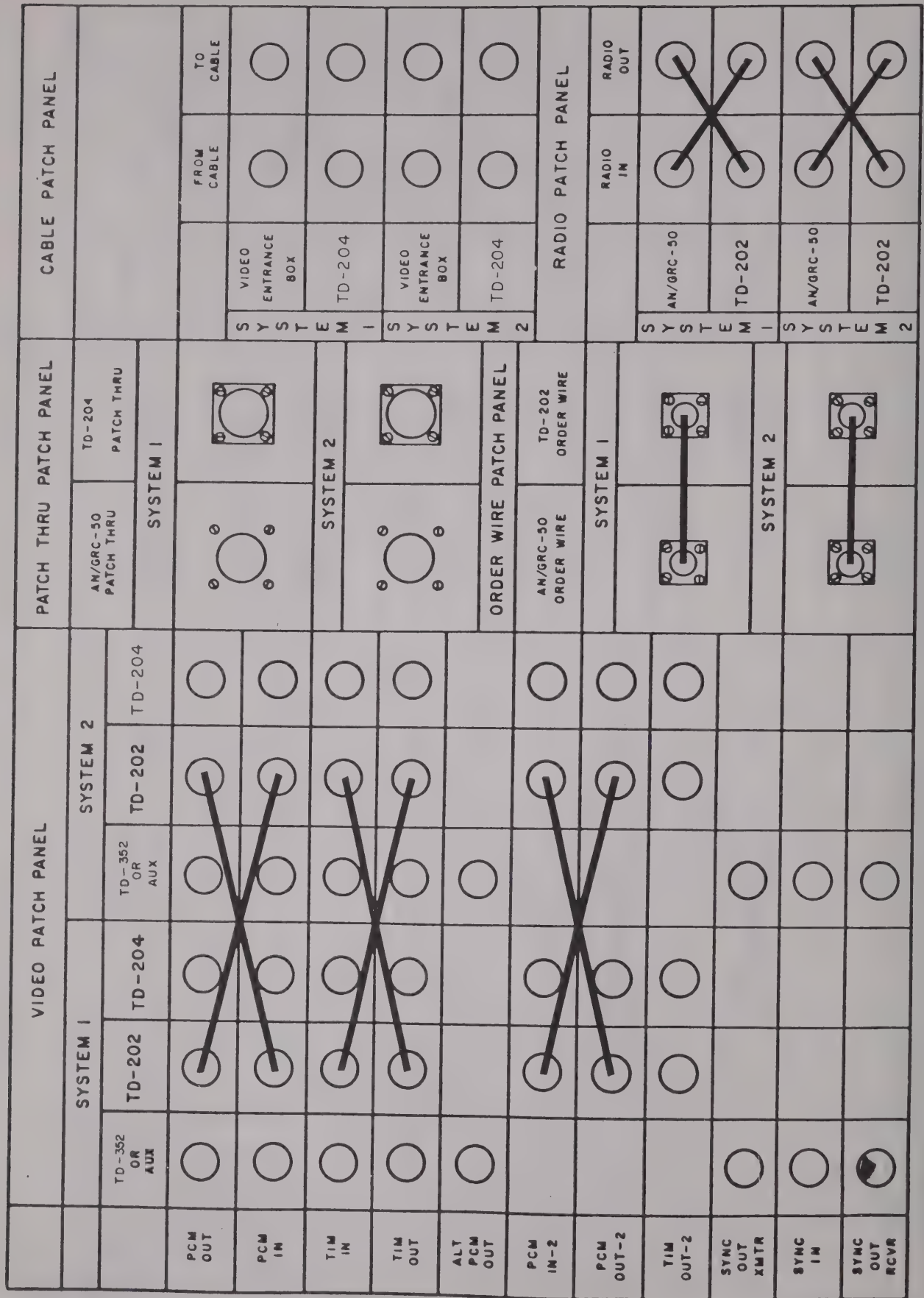
EL3TT089

Figure 2-32. Patch panel connection, cable-radio conversion, 12/24-channels, intermit connection diagram.



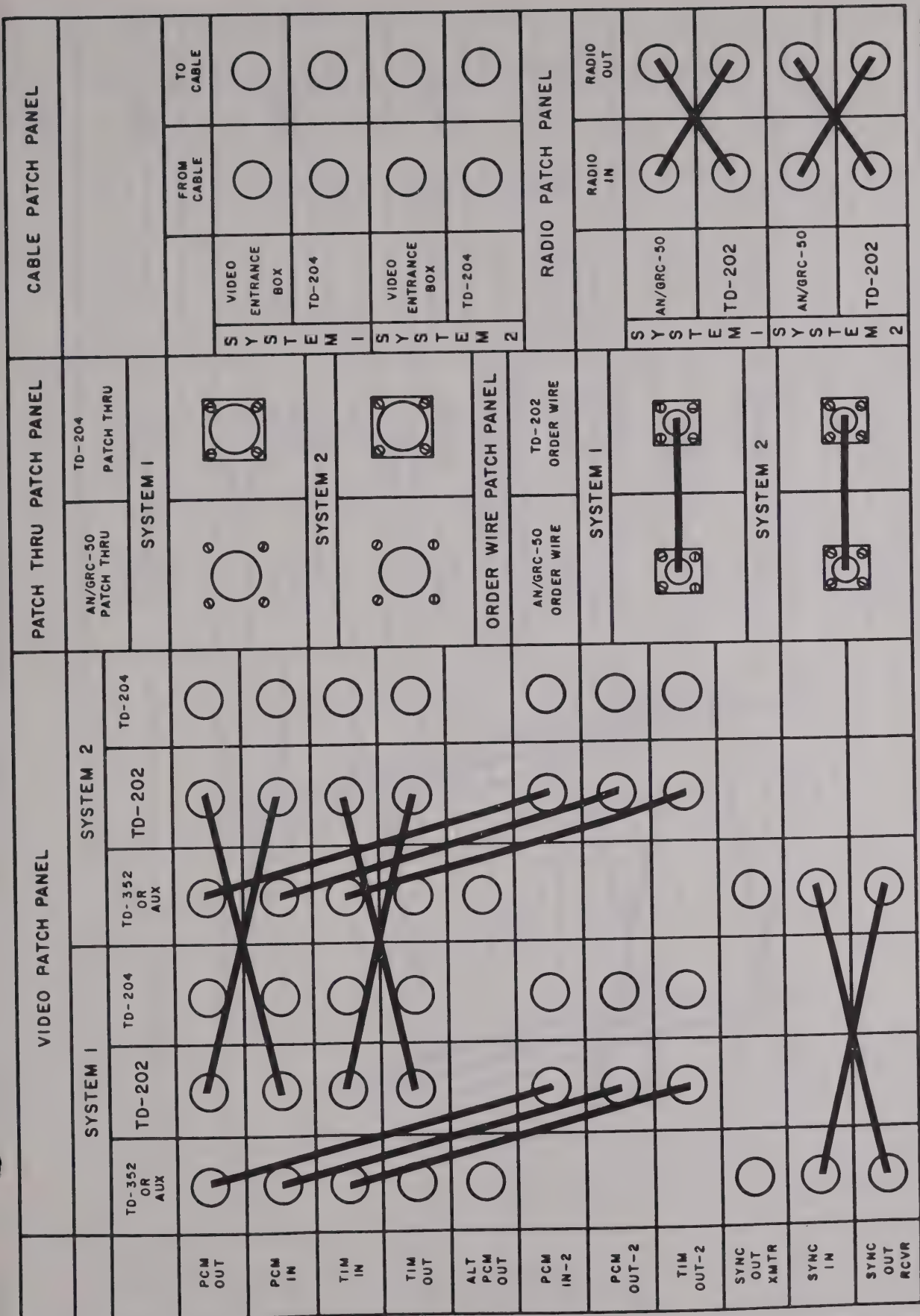
EL3T090

Figure 2-33. Patch panel connections, radio repeater/relay, 12-channels, interunit connection diagram.



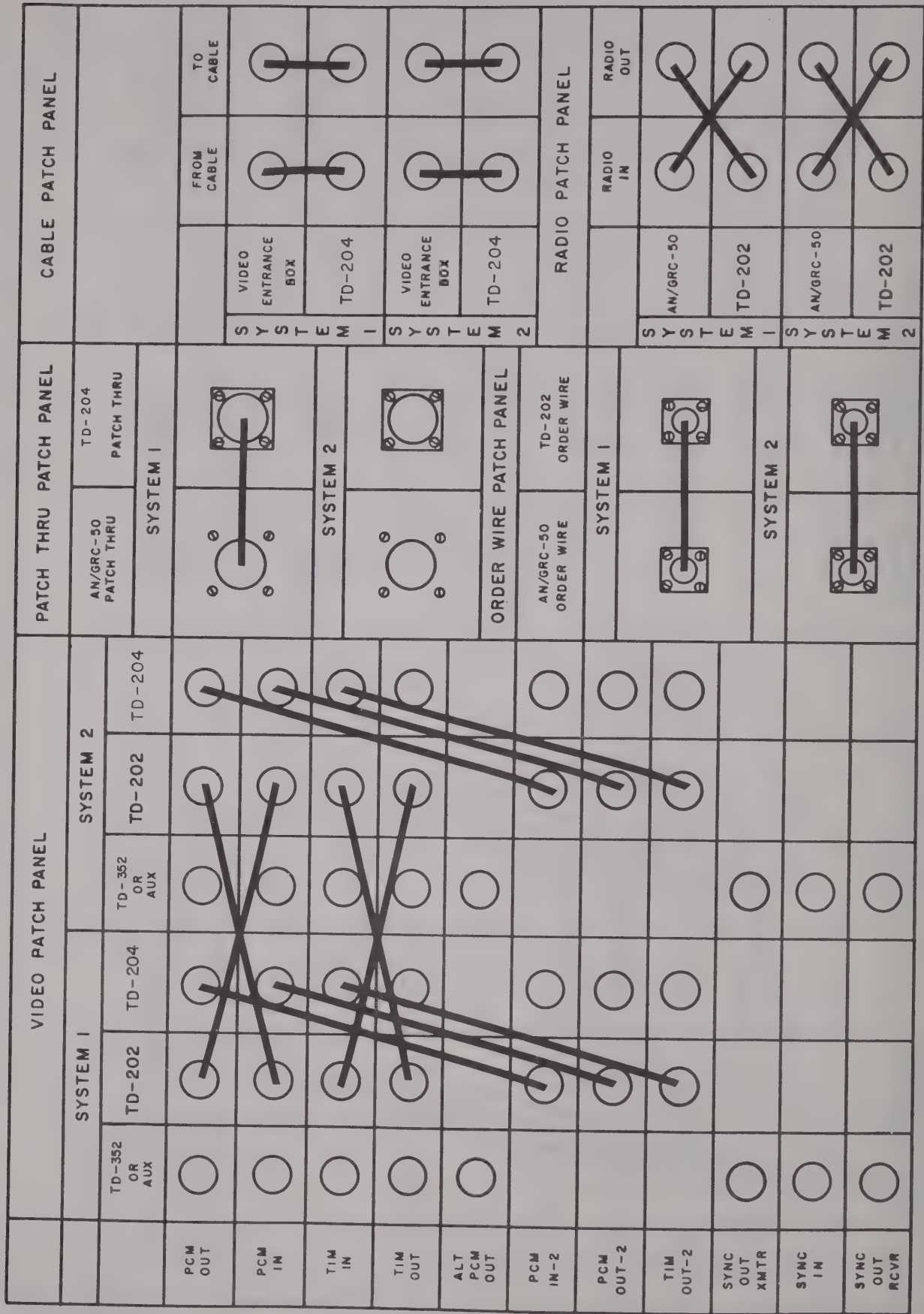
EL3TT091

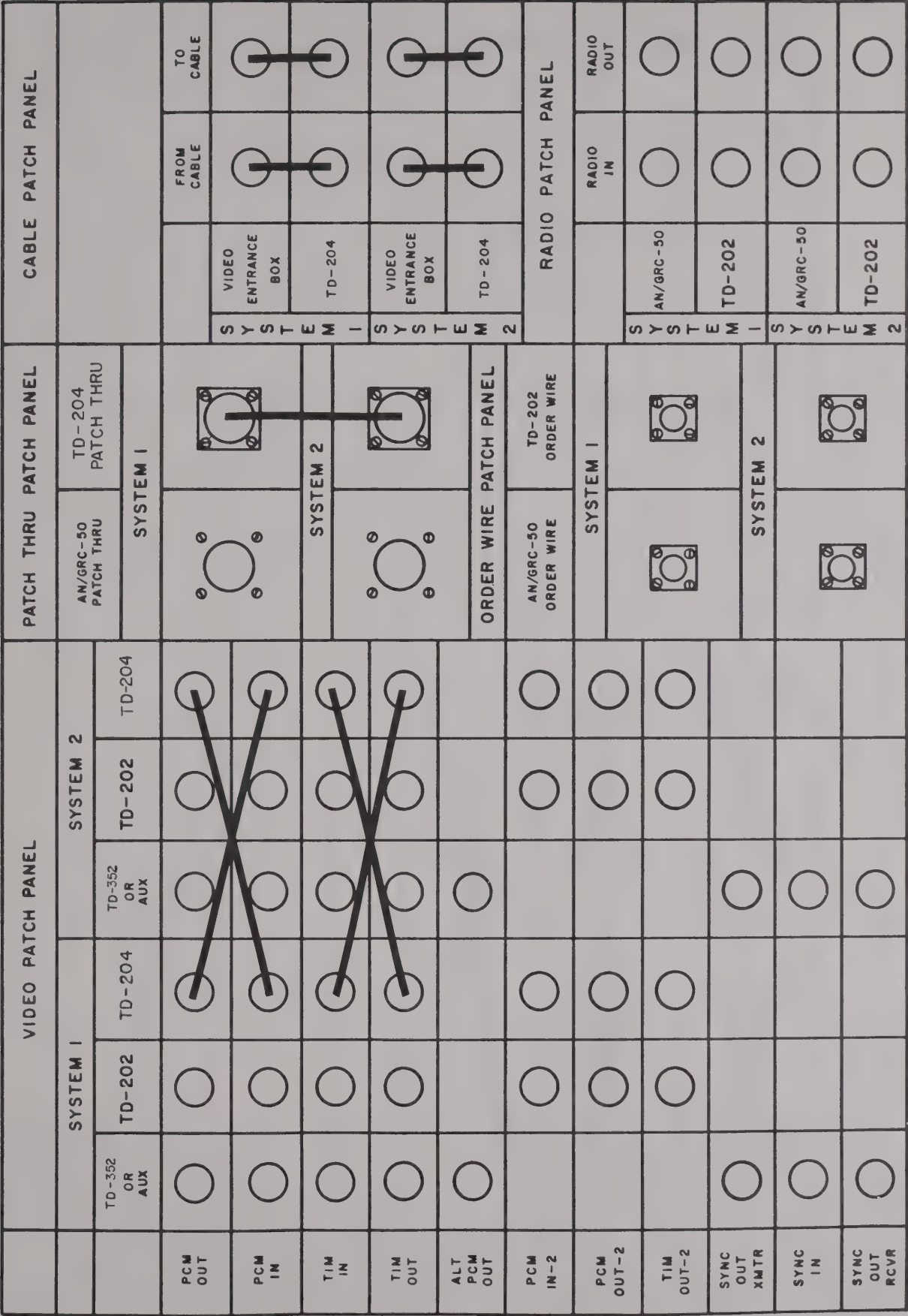
Figure 2-34. Patch panel connections, radio repeater/relay 24-channels, interunit connection diagram.



EL3TT092

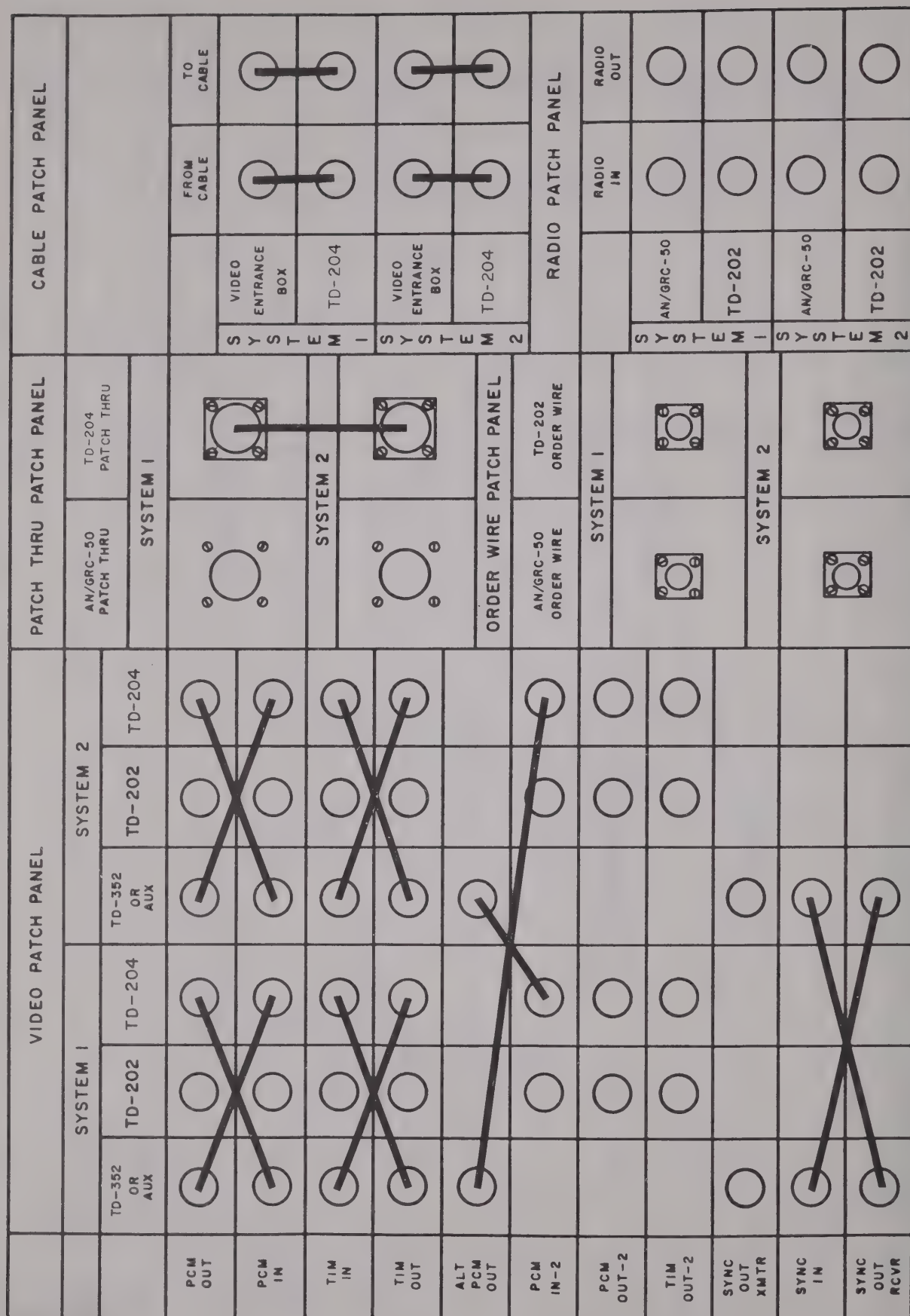
Figure 2-35. Patch panel connections, radio repeater/relay with local 12-channel drop and insert, interunit connection diagram.





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Figure 2-37. Patch panel connections, cable repeater/relay, 12/24/48-channels, interunit connection diagram.



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Figure 2-38. Patch panel connections, cable repeater/relay with 12-channel drop and insert, interunit connection diagram.

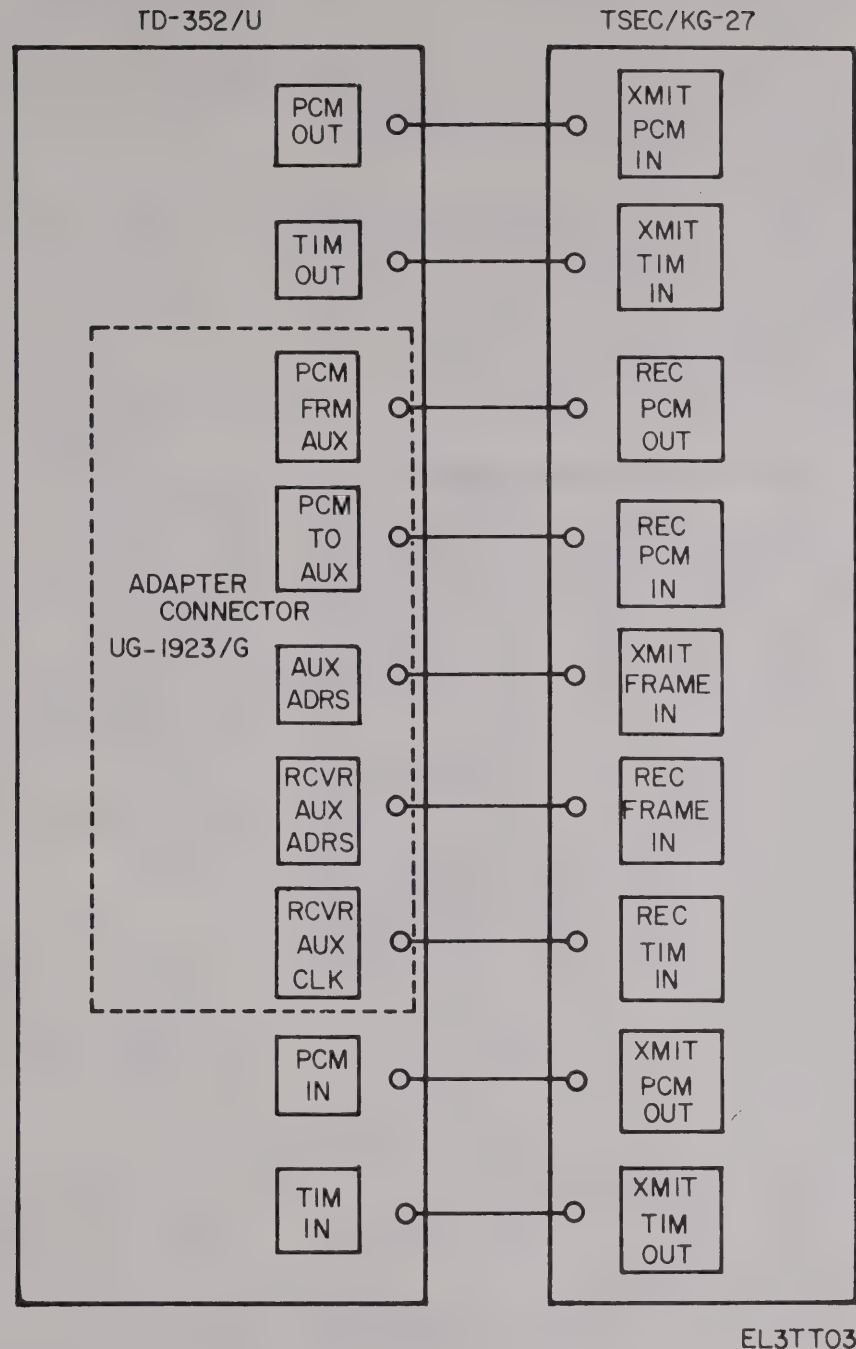


Figure 2-39. TSEC/KG-27 loopback connection diagram.

(6) Place the power switches of the TD-352/U's and TSEC/KG-27's to the ON position.

(7) Rotate the TSEC/KG-27 monitor select switch to all positions; ensure that the monitor lamp lights and no alarm condition exists. The multiplexers frame and no visible or audible alarm conditions exists. If performance is satisfactory, place the power switches of the TD-352/U and TSEC/KG-27 to OFF, disconnect the cabling hookup from TEST

OUT jack and replace on TO RADIO XMTR jack and continue with the installation procedure.

(8) Identify the end of each cable labeled TD-352/U and TD-202/U. Connect this end of each cable to the proper connector on the TD-352/U and TD-202/U.

(9) Patch as indicated in figure 2-28 for 12-channel for 2-29 for 24-channel operation.

(10) Slide the TSEC/KG-27 part way into its

assigned space in the rack. Connect the free end of each cable to its correct connector on the rear of the TSEC/KG's (KAM 258A/KG-27).

NOTE

If TSEC/KG's are received with mounting bracket installed, remove the brackets and store for future use.

(11) Disconnect the appropriate system PCM IN and OUT and TIM IN and OUT cables connected to the SECURE-BYPASS bracket on the shelter wall. Connect these cables to their associated connectors on the rear of the TSEC/KG-27.

(12) Connect the power cable between the TSEC/KG-27 and its power outlet.

2-12. Local Communications Connections

a. Nonsecure Operation. In nonsecure operation, local communications facilities (TA-312/PT and LS-147C/FL) may be connected through pairs 25 and 26 of the 26-pair cable to the binding posts marked PHONE and INTERCOM, in either the SIGNAL ENTRANCE BOX or POWER & SIGNAL ENTRANCE BOX.

b. Secure Operation. In secure operation, pairs 25 and 26 of the 26-pair cable are disconnected from the binding posts on the SIGNAL ENTRANCE BOX. These may NOT be used for secure operation. The PHONE and INTERCOM binding posts on the POWER & SIGNAL ENTRANCE BOX are connected to the TA-312/PT and LS-147C/FL, respectively, and field wire connections may be made to the binding posts as required for the application.

2-13. Installation of Antenna System

a. Removal From Assemblage (F, fig. FO-1)

(1) Loosen the fasteners that secure the door sill protective bracket to the loading chute and position the bracket over the door sill.

(2) Unfasten the straps that secure Bag Assemblies BG-102A to the loading chute and place them outside the assemblage.

(3) Remove Antenna Support AB-957/GRC from the loading chute and place it outside the assemblage.

(4) Loosen the screws that secure the loading chute. If the AN/TRC-117(*) is truck-mounted, rest the feet of the loading chute on the ground and fasten the upper end of the chute securely to the tailgate of the truck. If the AN/TRC-117(*) is installed on the ground, remove the loading chute from the assemblage and store it.

(5) Turn the reel tiedown bar to release Reels, Cable RC-436/GRC and place the reels and antenna cables outside the assemblage.

(6) Unfasten the straps that secure the accessory bags on top of Masts AB-577/GRC. Store the straps and remove the accessory bags from the assemblage.

(7) Remove Antennas AT-903/G from the brackets on the roadside wall and remove them from the assemblage.

WARNING

Each AB-577/GRC weighs over 200 pounds and is cumbersome to handle in the limited space inside the assemblage. At least two people should handle each AB-577/GRC to avoid injury to personnel. If the AN/TRC-117(*) is truck-mounted, slide each AB-577/GRC slowly down the loading chute.

(8) Unfasten the straps that secure the folding chair to the lower AB-577/GRC on the curbside of the assemblage and place it out of the way.

(9) Unfasten the top AB-577/GRC mounted next to the curbside wall and remove it from the assemblage.

(10) If the other AB-577/GRC is required, unfasten the mounting brackets and remove it from the assemblage. Do not remove the lower AB-577/GRC unless it is required for operation.

(11) Open the accessory bags and check to see that all components are present for each antenna installation.

WARNING

During assembly and erection of the antenna system, conform to all safety instructions in the beginning of this chapter. Injury or DEATH can result from failure to comply with all safety regulations.

b. Layout and Installation of Guy Anchors (fig. 2-40).

(1) Drive a Stake GP-2 (mast location stake) approximately halfway into the ground at the spot selected for the mast location.

(2) Slip one loop of the 30-foot leg of the radius rope over the mast location stake and extend it in the direction the AT-903/G (fixed) will face. Drive a second GP-2 (first guy anchor) into the ground at the 30-foot point to act as a marker (A).

(3) Slip the end loop of the 52-foot section of the radius rope over the first guy anchor. Locate the point at which both sections of the rope are taut on the right side of the mast location stake and drive a third GP-2 (second guy anchor) into the ground (B).

(4) Locate the point on the opposite side of the mast location stake where both sections of the radius rope are taut and drive a fourth GP-2 (third guy anchor) into the ground (C).

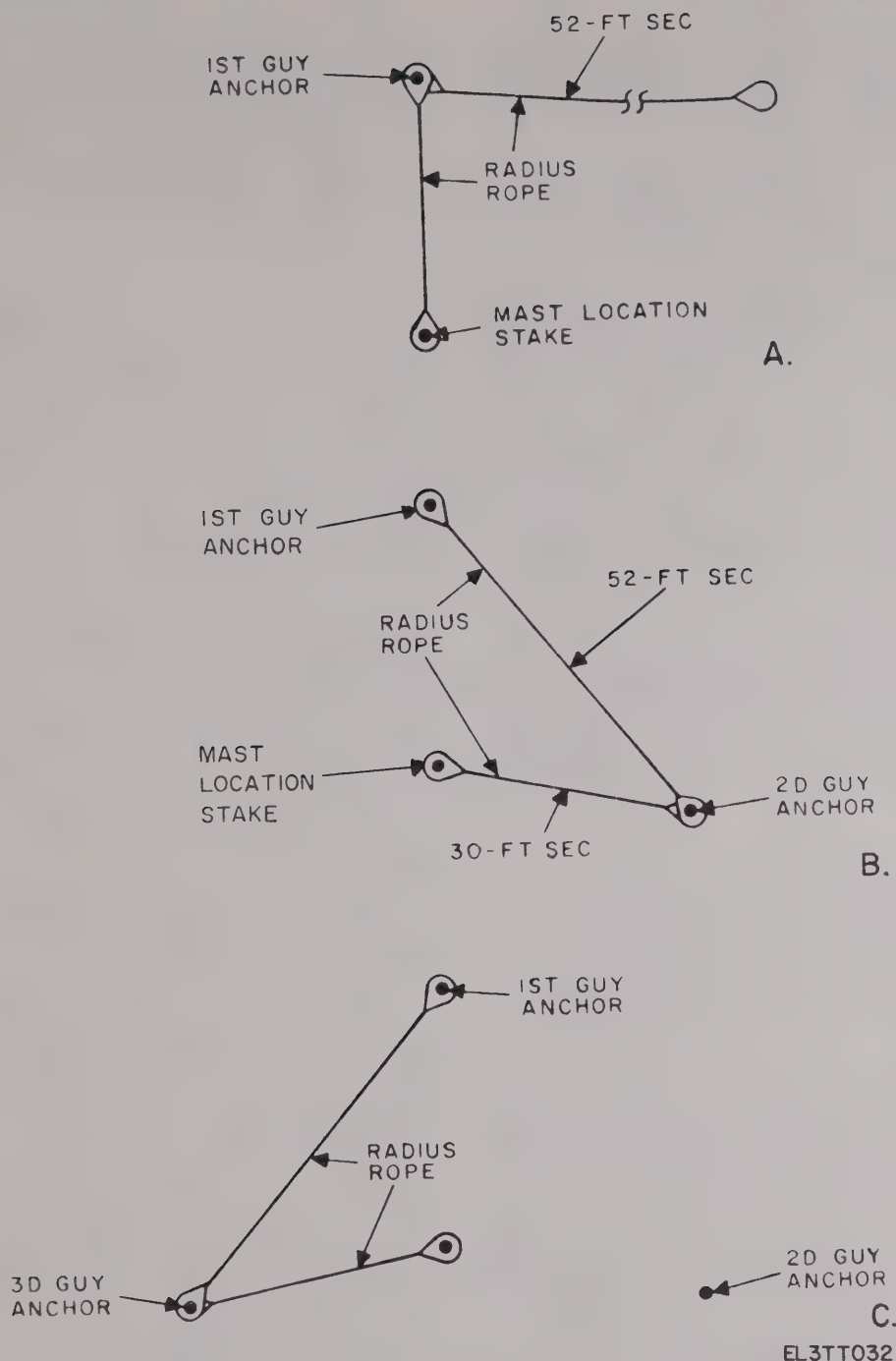


Figure 2-40. Layout of guy anchor stakes.

NOTE

When attaching the required antenna mast guy wires to the shackle on the GP-113/G guy stakes, only two of the required three guy wires can be attached to each stake shackle. To alleviate this problem, the shackles on the three GP-112 guy stakes in the accessory bag furnished with each antenna Mast AB-577/GRC should be used since they are not used when the GP-

113/G stakes are used. One each of the GP-112 shackles should be added to each GP-113/G stake. This will provide an additional attachment point on each GP-113/G stake for the third antenna guy wire.

(5) Remove the GP-2's and drive Stakes GP-113/G into the ground at the locations of the first, second, and third guy anchors with the rings of the GP-113/G's pointing toward the mast location

stake. Angle the GP-113/G's into the ground at approximately a 60-degree angle away from the mast location stake, and drive them into the ground until the rings are just above ground level.

c. Preparation of Launcher.

(1) Position the bottom of the launcher at the mast location stake with the top of the launcher facing away from the direction of the first guy anchor. Remove the mast location stake.

(2) Install a GP-2 in each side of the launcher base in the holes provided, to act as a hinge when the launcher is raised.

(3) Drive a GP-2 in front of each of the GP-2's in the launcher base.

(4) Remove one mast from the mast section carrier and then use the mast section carrier to support the top of the launcher assembly in a convenient working position for assembling the AT-903/G and the mast.

d. Polarization and Elevation-Depression Adjustments for AT-903/G.

(1) Check to see that the mounting frame is attached to the AT-903/G to provide proper polarization. The arrow on the back of the AT-903/G will indicate the element polarization when mounted.

NOTE

Polarity can also be checked by viewing the coaxial cable at the point it enters the feed horn. If the cable enters from the bottom of the feed horn, the polarity is vertical. If it enters from the side, the polarity is horizontal.

(2) Determine the proper elevation-depression angle for the AT-903/G from the chart in figure FO-2. Refer to a local topographic map to determine the relative elevations of the sites and the distance between them.

(3) Release the locking handle on the elevation-depression bracket of the AT-903/G and elevate or press as required.

(4) Lock the handle in position.

e. Assembly of Antenna AT-903/G (fig. 2-41).

(1) Remove the locking pin from the rear of the elevator on the launcher assembly and secure the pin to prevent tangling during assembly.

(2) Remove the pin from the handbrake handle on the launcher assembly and insert the mast section, bottom first, through the top of the launcher assembly.

(3) Remove the locking pin from the locking bar of the winch cable reel and lock the bar in the open position. Slightly lower the elevator platform on the launcher and push the mast section in until it engages the base bearing. Lock the handbrake.

NOTE

If one AT-903/G is to be mounted on the AB-577/GRC, attach it according to the procedure in (4) below. If two AT-903/G's are to be mounted with the use of Antenna Support AB-957/GRC, perform the procedures in (5) through (11) below.

(4) Place an open mast section clamp over the top of the mast section and attach Antenna AT-903/G to the mast section. Make sure that the antenna is properly polarized and that the AT-903/G is set for the proper elevation or depression angle. Align the AT-903/G so that it points in the direction of the first guy anchor (GP-113/G) and tighten the mast section clamp, so that the slot in the adapter is in line with the direction of the first guy anchor (GP-113/G).

(5) Attach the antenna adapter to the top mast section with a mast section clamp so that the slot in the adapter is in line with the direction of the first guy anchor (GP-113/G).

(6) Remove the locking pin from the center bar and remove the antenna mount. (The antenna mount is stored in this position.)

(7) Replace the locking pin in the hole in the center bar.

(8) Slip the top guy ring over the antenna mount (on the mast) so that the guy lugs angle downward (toward the mast).

(9) Slide the center bar of the AB-957/GRC onto the mount on the antenna adapter, and rotate the AB-957/GRC until the locking pin engages the slot in the antenna mount. The AB-957/GRC should be at right angles to the direction of the first guy anchor (GP-113/G).

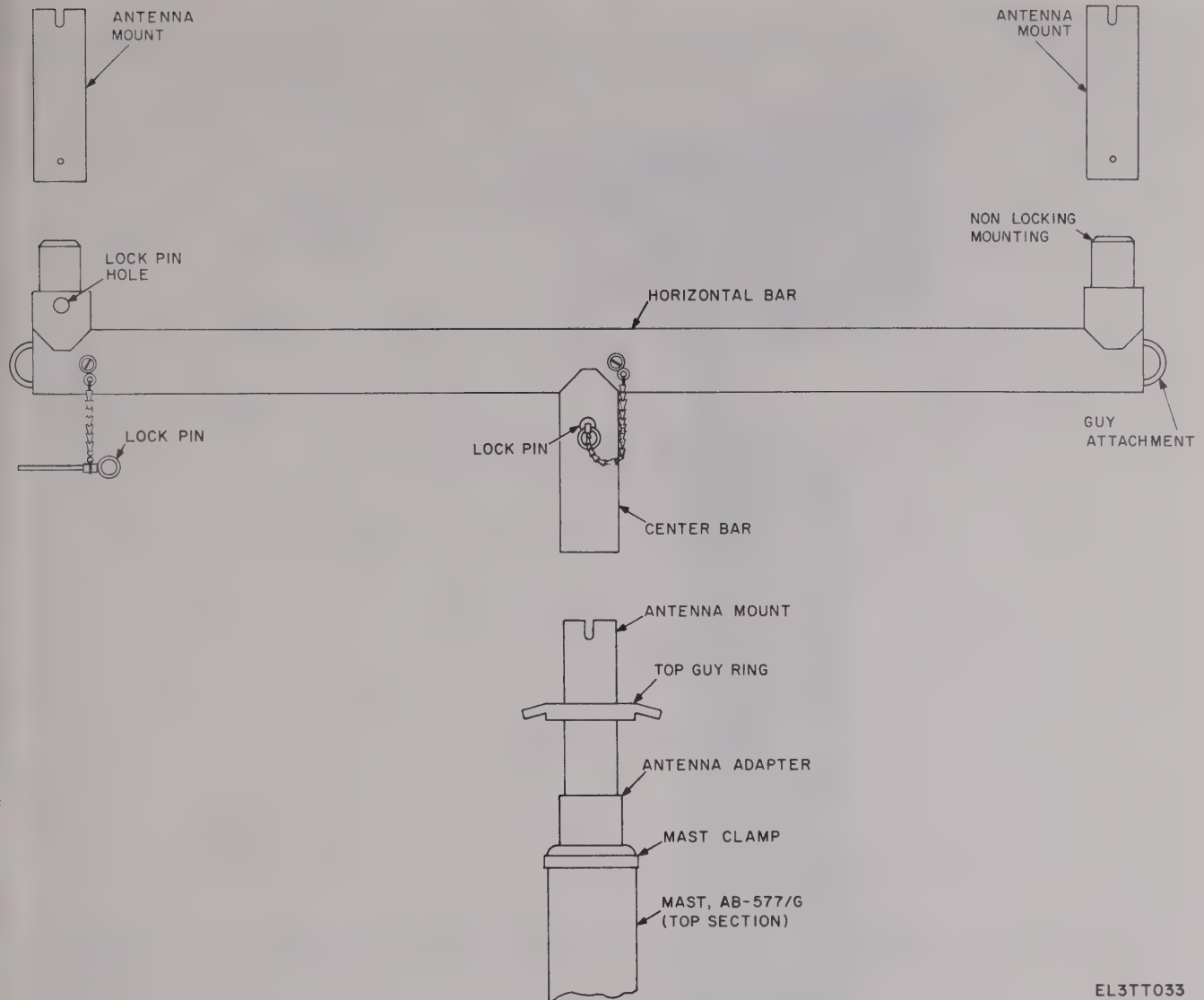
(10) Mount one AT-903/G (facing in the proper direction) on the fixed antenna mount of the AB-957/GRC. Rotate the AT-903/G until the pin in the base engages the slot in the antenna mount.

(11) Slip the antenna mount, removed from the center bar in (6) above, onto the nonlocking mounting of the AB-957/GRC. Mount the second AT-903/G on the antenna mount and rotate the AT-903/G and the antenna mount to engage the pin in the AT-903/G in the slot of the antenna mount.

f. Attaching Guys (figs. 2-41 and 2-42).

(1) Attach the snubber ends of two of the launcher guys (coded blue to the second and third guy anchors (GP-113/G's). Attach the other ends of the guys to the guy holes in the top of the launcher. Adjust the lengths of these guys to approximately 36 feet.

(2) Attach the top end of the third launcher guy (coded blue) to the remaining guy hole in the top of the launcher. DO NOT attach the snubber end



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Figure 2-41. Assembly of Support, Antenna AB-957/GRC on Mast AB-577/GRC.

of this guy.

(3) Attach the three top guys (coded red) to the top guy ring assembly on the AT-903/G (on the antenna adapter if the AB-957/GRC is used). Do not attach the lower ends of the top guys.

(4) If the AB-957/GRC is used, attach two 65-foot guys (coded red) to each guy attachment on the ends of the AB-957/GRC horizontal bar.

(5) Attach two 65-foot guys (coded red) to the support frame of the free-moving AT-903/G on the AB-957/GRC so that it can be moved from the ground after the mast is erected.

g. Erection of Launcher.

(1) Raise the launcher to a vertical position (fig. 2-41). The launcher will stand unsupported if the base is level. Attach the loose launcher guy to the first guy anchor (GP-113/G).

(2) Drive two GP-2's through the holes in the front of the launcher base into the ground to pre-

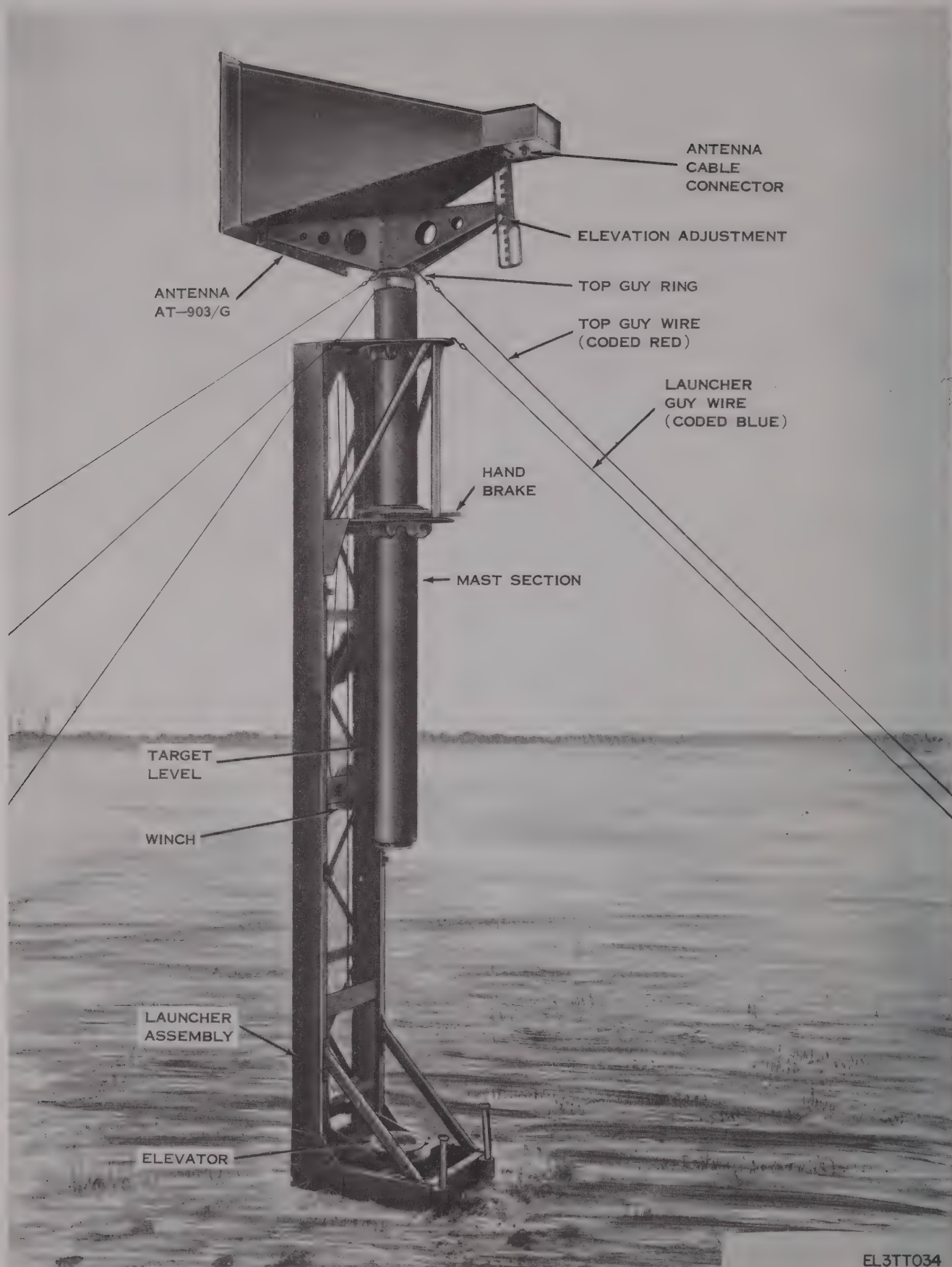
vent the launcher from shifting position. Do not drive the GP-2's completely into the ground. Remove the GP-2's installed in the sides of the launcher (c(2) above).

(3) Remove the winch from the accessory bag and install it on the launcher frame. Slide the latch (on the rear of the winch reel supporting frame) over the winch shaft to lock the winch in position. Make sure the elevator cable is properly threaded over the pulley wheels.

(4) Operate the winch to raise the elevator to the bottom of the first mast section. Drive the third GP-2 through the rear of the launcher into the ground.

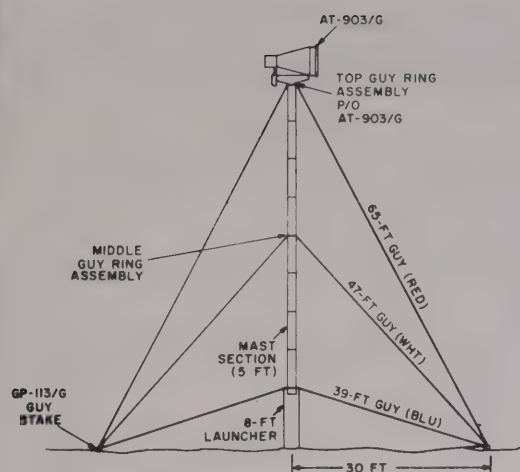
(5) Check the target level on the launcher frame to see that the launcher is level. Adjust the launcher frame if necessary.

(6) Unscrew the snubber adjustment to the fully extended position on the launcher guys. Unlock

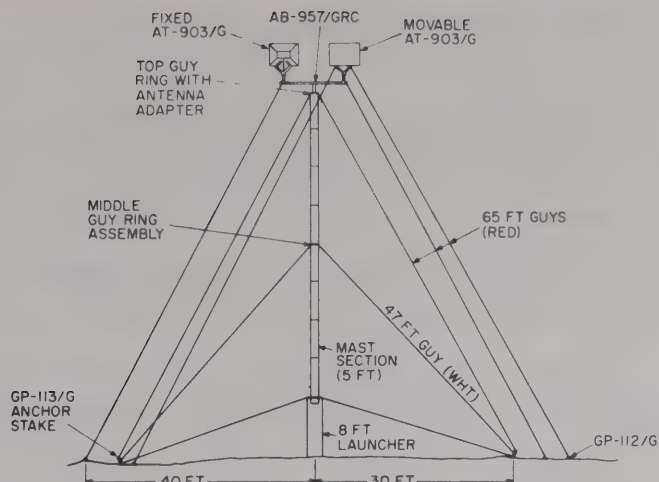


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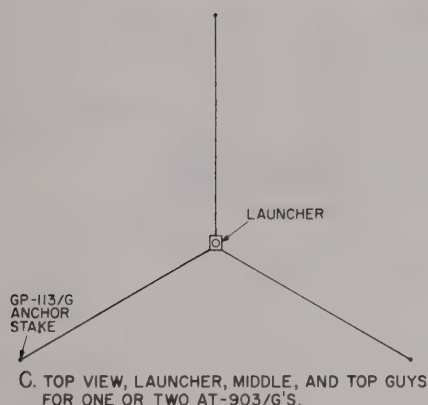
Figure 2-42. Launcher assembly in position with one mast section and one AT-903/G mounted.



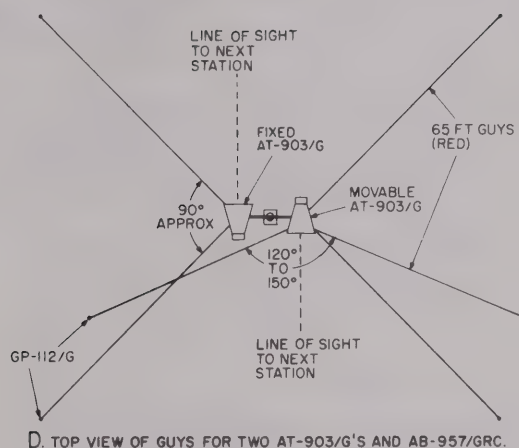
A. SIDE VIEW, ONE AT-903/G.



B. SIDE VIEW, TWO AT-903/G'S ON AB-957/GRC.



C. TOP VIEW, LAUNCHER, MIDDLE, AND TOP GUYS FOR ONE OR TWO AT-903/G'S.



D. TOP VIEW OF GUYS FOR TWO AT-903/G'S AND AB-957/GRC.

NOTES:

1. GP-112/G'S POSITIONED AS REQUIRED FOR AT-903/G ORIENTATION.
2. AT-903/G'S SHOWN VERTICALLY POLARIZED.

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Figure 2-43. Antenna installation using one AT-903/G or two AT-903/G's on AB-957/GRC.

the snubber clamp and take up the slack on the launcher guys. Check the target level and adjust the snubber adjustments until the launcher is level.

(7) Drive the GP-2's in the base of the launcher frame completely into the ground. Recheck the level and readjust the launcher guys if necessary.

(8) Install the spanner wrench from the accessory bag in the launcher base to act as a foot lever.

h. Attaching Antenna Cables.

NOTE

Perform the procedures in (1) through (8)

below before attempting to attach the antenna cables to the AT-903/G's.

(1) Tune Radio Set AN/GRC-50(V) as described in paragraph 3-4a, b, and c and either 3-4e or d before proceeding to (2) below.

(2) Operate the PP-2054/GRC to the STAND-BY position and disconnect the cable connected between Dummy Load DA-189/GRC and the TO ANT receptacle on the front of the AM-1957/GRC or AM-1958A/GRC.

(3) Connect the assemblage antenna cable from

the VIDEO & SIGNAL ENTRANCE BOX to the TO ANT receptacle on the front of the AM-1957/GRC or AM-1958A/GRC.

(4) Connect one end of the antenna cable (CG-1859/U) to the SYSTEM 1 or SYSTEM 2 receptacle in the VIDEO & ANTENNA ENTRANCE BOX using a cable grip. Bring the free end of the antenna cable into the assemblage.

(5) Connect Cable Assembly CG-7188B/U (fig. 2-25) supplied with Reel RC-436/GRC) to the dummy load.

(6) Attach Adapter Connector UG-1374/U (supplied with Reel RC-436/GRC) to the antenna cable.

(7) Connect the free end of the CG-718B/U to the UG-1374/U.

(8) Operate the PP-2054/GRC to the OPERATE position and observe the indication on Dummy Load DA-189/GRC. The following indications are the approximate minimum readings allowable:

| | |
|---|-------------------------|
| AM-1957/GRC with CG-1859/U (80-foot) | -15 to 18 watts minimum |
| AM-1957/GRC with CG-1859/U (80-foot) and CG-1859/U (40-foot) | -13 to 15 watts minimum |
| AM-1958A/GRC with CG-1859/U (80-foot) | -5 to 8 watts minimum |
| AM-1958A/GRC with CG-1859/U (80-foot) and CG-1859/U (40-foot) | -3 to 5 watts minimum |

If the minimums cannot be attained retune the AN/GRC-50(V). If the minimum reading still cannot be obtained perform the troubleshooting procedures as outlined in chapter 5.

(9) Operate the T-893(P)/GRC multimeter selector switch to the REF PWR position and insure that the proper reading is obtained when the readings in (8) above are obtained.

NOTE

The above procedures will insure that all cabling and connectors are fully operational. Never raise the mast to the full height unless you are sure your outside plant equipment is good.

(10) Operate the PP-2054/GRC to the STAND BY position.

(11) Remove the CG-718B/U cable from Dummy Load DA-189/GRC.

(12) Connect the CG-718B/U removed in (11) above to the AT-903/G mounted to the antenna launcher and mast section. Use the rear of the launcher as a ladder to reach the connector.

(13) Connect the snap fastener of the CG-1859/U cable grip to the top guy ring.

(14) Position Reel RC-436/GRC so that the antenna cable comes off the reel easily as the mast is erected.

i. Raising Mast AB-577/GRC.

(1) Release the handbrake and operate the winch to raise the mast section to the upper limit. The elevator stop will determine the upper limit.

CAUTION

Always lock the handbrake securely before lowering the elevator and attaching the next mast section.

(2) Operate the winch to the lowest position of the elevator.

(3) Slip an open mast section clamp over the bottom joint of the mast section. Do not tighten the mast section clamp.

(4) Remove the next mast section from the mast section carrier and set the mast section in place on the elevator. Make sure that the bottom of the mast section seats correctly in the elevator platform.

(5) Step on the foot lever (spanner wrench, g(8) above) and raise the platform until the mast section meets the bottom of the mast section above it. Position the mast section clamp at the joint and lock it securely.

(6) Raise the elevator about 2 inches with the winch until the mast section rests on the elevator. Repeat the procedures in (1) above.

(7) Repeat the procedures in (2) through (6) above until the fifth mast section is raised about half-way and then lock the handbrake.

(8) Climb the rear of the launcher assembly and install the middle guy ring assembly between the fourth and fifth mast sections.

(9) Insert the locking pin through the holes in the guy ring assembly to lock it in place.

(10) Connect the top ends of the middle guy wires (coded white) to the middle guy ring. DO NOT attach the snubber ends.

(11) Release the handbrake and operate the winch to raise the fifth mast section to the upper limit.

(12) Repeat the procedures in (2) through (6) above until eight mast sections are raised. Align the yellow arrows on the eight mast sections and the elevator platform to insure that the mast section has engaged the base bearing.

CAUTION

In winds exceeding approximately 25 miles per hour (mph) hold the upper guys taut during erection. When the antenna is fully erected, it can withstand winds up to 100 mph. If wind velocities in excess of 100 mph are normal for the site, reduce the height of the AB-577/GRC. The reduced height must be taken into consideration when determining line-of-sight paths and adjusting elevation-depression angles (*d*

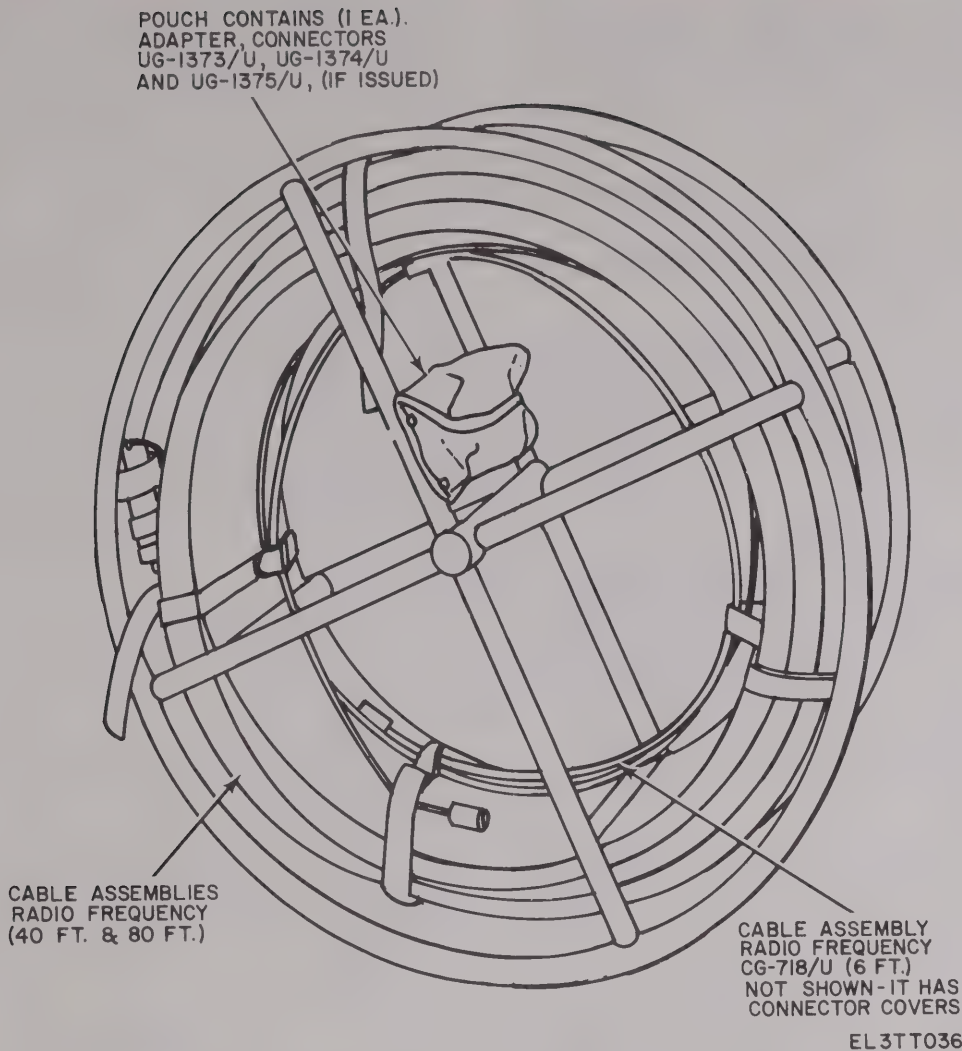


Figure 2-44. Reel, Cable RC-436/GRC with cables mounted.

above).

(13) When the last mast section is raised, securely fasten the handbrake.

(14) Connect the upper and middle guys to the upper and middle guy rings on the anchor stakes (GP-113/G's) and snub them loosely.

(15) If the AB-957/GRC is used, extend the guys attached to the guy attachments and attach the GP-112/G stakes and drive them into the ground (D, fig 2-40). Attach the guys connected to the free-moving AT-903/G to the CP-112/G's and drive them into the ground. DO NOT tighten the snubbers on the AB-957/GRC or AT-903/G.

(16) Remove the foot lever from the base of the launcher.

(17) Install the mast section carrier into the launcher to act as the base section for the mast.

(18) Lock the mast section carrier in place by closing the catches on the launcher frame.

(19) Release the handbrake and operate the winch to lower the mast until its complete weight

rests on the mast section carrier. There should be no tension in the winch cable for the elevator. Lock the handbrake securely.

j. Final Adjustments.

(1) Make sure that plenty of slack is in the middle and top guy wires.

(2) Check the level of the launcher with the target level. If necessary, adjust the launcher guys to level the launcher.

(3) Adjust the tension on the middle guy wires until the lower half of the mast is straight.

NOTE

To check the vertical alignment of the AB-577/GRC, observe it from a distance and compare it with a known vertical object.

(a) Unscrew the snubber adjustment to its fully extended position.

(b) Unlock the snubber clamp and take up the slack in the guy.

(c) Correct any misalignment of the AB-577/GRC by tightening the snubber adjustment.

(4) Repeat the procedures in (3) above for the top guys and recheck the level of the mast and

launcher with the target level. Make sure that the guys are tight and secure.

(5) Attach the antenna cable (CG-1859/U) to a guy stake to prevent damage caused by wind.

Section IV. PRELIMINARY ADJUSTMENT OF EQUIPMENT

2-14. Preliminary Checks and Adjustments.

(figs. 2-45 and 2-46).

a. *Assemblage Power and Lighting.* Check to see that all circuit breakers on the POWER DISTRIBUTION PANEL and the SYSTEM 1 and SYSTEM 2 circuit breakers of the front and roadside equipment racks are operated to OFF.

b. *Energizing Ac Circuits.*

CAUTION

If alternating-current (ac) power should fail, be sure that the SYSTEM 1 and SYSTEM 2 circuit breakers on both the roadside and front equipment racks (fig. FO-1) are operated to OFF until power is restored and the CN-514/GRC REGULATED OUTPUT VOLTAGE meter indicates 115 volts.

(1) If a generator set is used to supply power, start the generator; if a central power source is used, turn on the power.

(2) Operate the POWER DISTRIBUTION PANEL MAIN circuit breaker to ON.

(3) Operate the POWER DISTRIBUTION PANEL LIGHTS circuit breaker to ON, and the FLUORESCENT LIGHTS switch to ON. If the temperature in the assemblage is too low for the fluorescent lights to start, operate the INCANDESCENT COLD START LIGHTS switch to ON until the assemblage is heated sufficiently for the fluorescent lights to operate.

(4) If blackout conditions are required, operate the BYPASS-BLACKOUT switch to BLACKOUT; otherwise operate it to BYPASS.

(5) Check the POWER DISTRIBUTION PANEL VOLTS A.C. meter; it should indicate 115 volts \pm 6. Check the A.C. AMPERES meter; it should indicate less than 2 amperes.

(6) Energize equipment as prescribed in applicable paragraphs.

c. *TA-312/PT.*

(1) Install two batteries, BA-30, in the battery case of the TA-312/PT, one facing upwards and the other facing downwards.

(2) Operate the CP-LB-CBS switch to the LB position.

d. *Voltage Regulator CN-514/GRC.*

(1) Ensure that the SYSTEM 1 and SYSTEM 2

circuit breakers are in the OFF position.

(2) Operate the VOLT REG circuit breaker on the POWER DISTRIBUTION PANEL to ON; the associated indicator will light.

(3) Check the indication on the CN-514/GRC REGULATED OUTPUT VOLTAGE meter; if the indication is less than 115 volts, operate the MANUAL-AUTOMATIC switch to MANUAL. Operate the RAISE-LOWER switch to RAISE and while observing the meter, increase the voltage to exactly 115 volts.

(4) If the indication is more than 115 volts, operate the RAISE-LOWER switch to LOWER and while observing the meter, decrease the voltage to exactly 115 volts.

(5) Operate the CN-514/GRC to OFF for a few seconds and then back to ON. Check to see that the meter still reads 115 volts.

(6) Operate the RAISE-LOWER switch to lower until a meter indication of 110 volts is obtained. Operate the MANUAL-AUTOMATIC switch to AUTOMATIC; the voltage indication should return to 115 volts.

WARNING

Be sure that the POWER switch of the CV-1548/G is OFF. Voltage of more than 121 V ac will damage the equipment, or possibly cause an explosion resulting in injury to personnel.

(7) Operate the MANUAL-AUTOMATIC switch to MANUAL. Operate the RAISE-LOWER switch to RAISE until a meter indication of 120 volts is obtained. Operate the MANUAL-AUTOMATIC switch to AUTOMATIC; the voltage indication should return to 115 volts.

(8) Operate the overvoltage protection device to ON; the indicator will light. Operate the SYSTEM 1 and SYSTEM 2 circuit breakers to ON.

e. *Multiplexer TD-202/U.* Perform the following procedures on both TD-202/U's in the AN/TRC-117(*).

(1) Check to see that the AC POWER switch is operated to OFF.

(2) Operate the METER SELECT switch to SERV FAC.

(3) Press the PRESS TO RELEASE CHASSIS button and slide the TD-202/U out of its case far

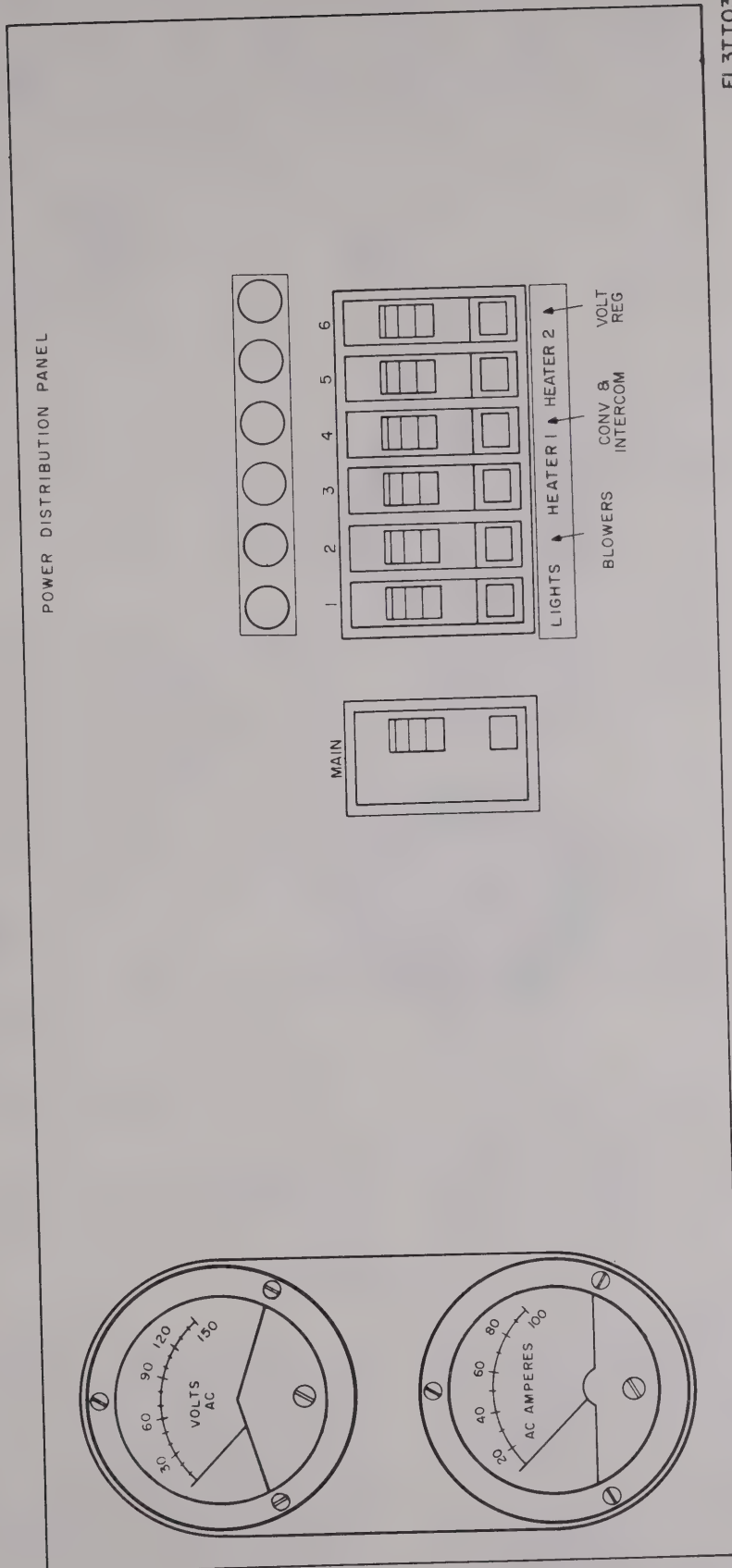
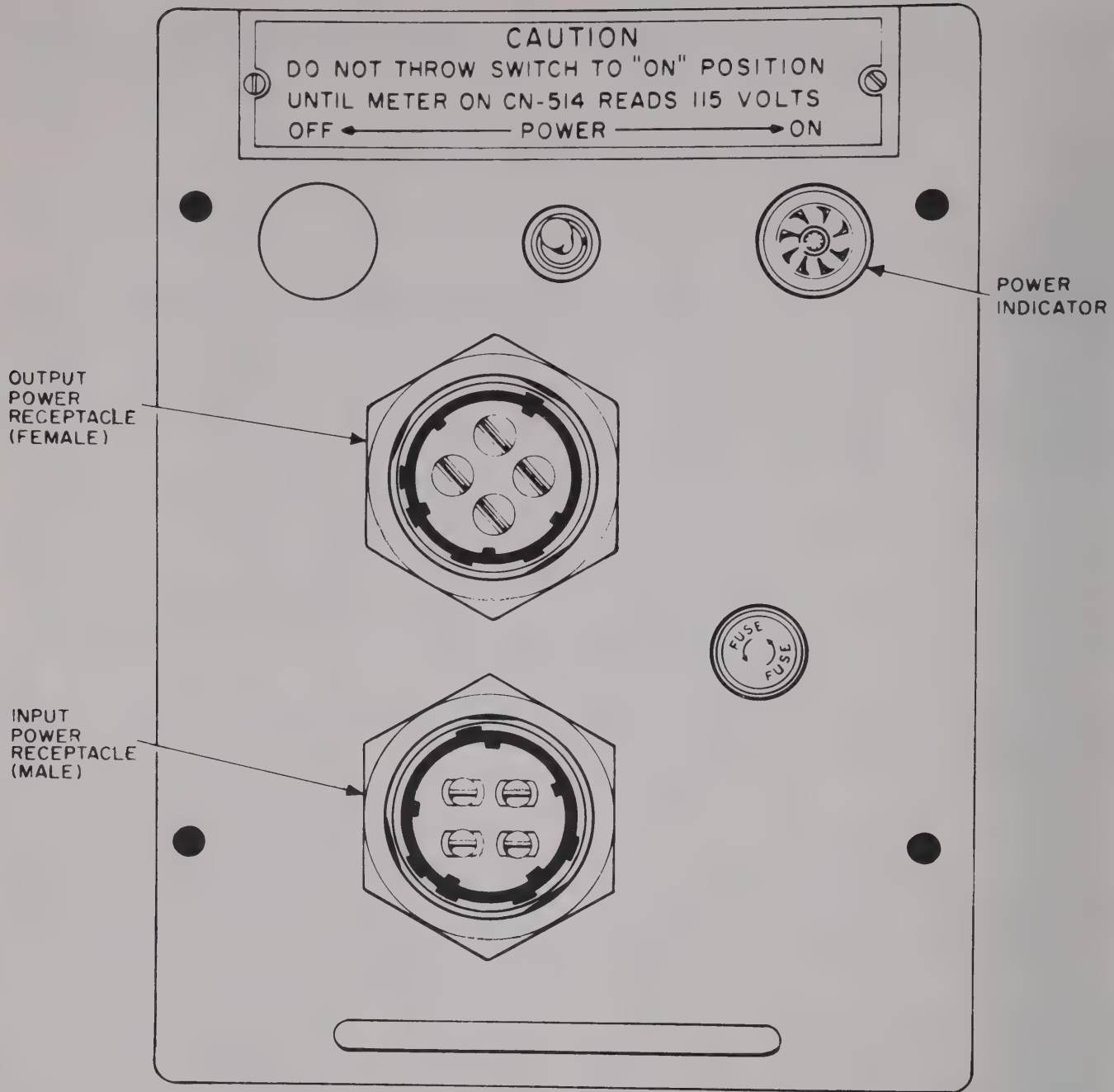


Figure 2-45. POWER DISTRIBUTION PANEL.



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Figure 2-46. Overvoltage protection device.

enough to expose the service facility panel.

(4) Operate the TRAFFIC SEL switch to the position corresponding to the traffic capacity of the system as specified in table 2-2.

(5) Operate the OPR-TEST switch to OPR.

NOTE

If the buzzer sounds during the following procedures, operate the ALARMS BUZZER OFF switch on the front panel to silence the buzzer.

(6) Operate the AC POWER switch to ON. Check to see that the AC POWER indicator lights.

(7) Operate the SERV SEL switch through +10, +4.5 and -4.5; check to see that the TEST ALIGN meter indicates in the center of the hairline yellow area for each position. If the proper indication are not obtained, adjust them using the voltage adjustment controls on the side panel.

(8) Operate the SERV SEL switch to -12; check to see that the TEST ALIGN meter indicates in the green area.

Table 2-2. Multiplexer TRAFFIC SEL Switch Position

| System configuration | TD-202/U TRAFFIC SEL switch position | | TD-204/U TRAFFIC SEL switch position | | TD-352/U ADDRESS switch position | |
|---|--------------------------------------|----------|--------------------------------------|----------|----------------------------------|----------|
| | SYSTEM 1 | SYSTEM 2 | SYSTEM 1 | SYSTEM 2 | SYSTEM 1 | SYSTEM 2 |
| 12-channel radio terminal* | 12 | 12 | — | — | MASTER | MASTER |
| 24-channel radio terminal | 24I | — | — | — | MASTER | SLAVE |
| 12-channel cable terminal* | — | — | 12 | 12 | MASTER | MASTER |
| 24-channel cable terminal | — | — | 24 | — | MASTER | SLAVE |
| 12-channel radio repeater | 12 | 12 | — | — | — | — |
| 24-channel radio repeater | 24R | 24R | — | — | — | — |
| 12/24/48-channel cable repeater | — | — | 48AR | 48AR | — | — |
| 12-channel cable radio conversion | 12 | 12 | 12 | 12 | — | — |
| 24-channel cable-radio conversion | 24R | 24R | 48AR | 48AR | — | — |
| 24-channel radio repeater with local drop and insert | 24S | 24S | — | — | SLAVE | SLAVE |
| 24-channel radio repeater with remote drop and insert | 24S | 24S | 12 | 12 | — | — |
| 24-channel cable repeater with local drop and insert | — | — | 24 | 24 | SLAVE | SLAVE |

*Indicates that either SYSTEM 1 or SYSTEM 2 components may be used for each system connected.

NOTE

Verify that switch settings are the same when secure.

f. Multiplexer TD-204/U. Perform the following procedures on each TD-204/U connected in an operating system. If a TD-204/U is not connected in a system, perform the procedures in (1) through (6), (8), (12), and (13) below.

(1) Operate the AC POWER, CABLE POWER, and TALK-OFF-SIG switches to OFF.

(2) Press the PUSH TO RELEASE CHASSIS button and slide the TD-204/U out of its case far enough to expose the service facility panel and panel assemblies 6A4 and 6A5.

(3) Operate the TRAFFIC SEL switch to the position corresponding to the traffic capacity of the system as shown in table 2-2.

(4) Operate the NORM OPR-ZERO SET-READ switch to NORM OPR.

(5) Operate both MILES switches to 0.

(6) Operate the TONE-OFF switch on panel 6A2 to OFF.

(7) Operate the MILE switches on panels 6A4 and 6A5 to the position corresponding to the distance to the first TD-206/G in the transmission cable.

NOTE

Both the MILE switches (on panel 6A4 and 6A5) in a TD-204/U must be at the same position at any given time when one or more TD-206's are used in the cable link. If two TD-204/U's are connected with 1 mile or less of transmission cable, operate the panel 6A4 MILES switch to the position corresponding to the transmission cable length ($\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$, or 1) and the panel 6A5 MILE switch to 1.

(8) Operate the AC POWER switch to ON. Check to see that the AC POWER and ALARMS NO CABLE CURRENT indicators light and the buzzer sounds. Silence the buzzer with the ALARMS BUZZER OFF switch.

NOTE

If the buzzer sounds during the following procedures, press the ALARMS BUZZER OFF switch to silence it.

(9) Operate the CABLE POWER switch to ON. Check to see that the ALARMS NO CABLE CURRENT indicator is extinguished.

NOTE

Cable power is required only when TD-206's are in the system.

(10) Operate the METER SELECT switch to CABLE I and check for a yellow area indication on the TEST ALIGN meter. If not, adjust the CABLE CURRENT ADJ control for a hairline indication on the TEST ALIGN meter.

(11) Operate the METER SELECT switch to CABLE V and check to see that the TEST ALIGN meter indicates 10.8 times the number of TD-206/G's in the cable link, plus 13.

(12) Operate the METER SELECT switch to SERV FAC.

(13) Operate the SERV SEL switch through -10, +10, SUM ± 3 , and BAL and check for a yellow area indication on the TEST ALIGN meter for each position. If not, adjust the VOLTAGE ADJUST control for the metered voltage to get a hairline indication on the TEST ALIGN meter.

(14) Operate the SERV SEL switch to RCC and check for a green area indication on the TEST ALIGN meter.

NOTE

Distant TD-204 must have Cable Power ON for this reading.

g. Multiplexer TD-352/U. Perform the following procedures on both TD-352/U's in the AN/TRC-117(*).

(1) Check to see that the AC POWER switch is operated to OFF.

(2) Press the PUSH TO RELEASE CHASSIS button and pull the TD-352/U far enough out of its case to expose the service facility panel and the three double channel modems.

(3) Operate the CHAN switch to OFF.

(4) If the system is secure, operate the AUX switch to IN; if the system is nonsecure, operate the AUX switch to OUT.

(5) Operate the ADDRESS switch to the appropriate position for the configuration as listed in table 2-2.

(6) Operate the METER SELECT switch to SERV FAC.

(7) Operate the AC POWER switch to ON.

(8) Operate the SERV SEL switch through +25, +10, +4.5, -4.5, and -12, and check for a yellow area indication on the TEST ALIGN meter. If not indicated, adjust to hairline using the voltage adjustment controls on the left side of the TD-352/U.

(9) Operate the SERV SEL switch to -5.2 and check for a green area indication on the TEST ALIGN meter.

h. Converter, Telephone Signal CV-1548/G

NOTE

To avoid hybrid singing which causes noise on the TD-352/U channels, always place the 2W/4W switches on the CV-1548/G to the 4-wire position for any channel that is not terminated (no subscriber).

(1) Operate the CV-1548/G AC POWER switch to OFF.

(2) Operate the CH-2W-4W and signaling mode switches for each channel as indicated below.

| <i>Vf channel connection</i> | <i>Switch position</i> | |
|---|------------------------|-----------------------|
| | <i>CH-2W-4W</i> | <i>Signaling mode</i> |
| 2-wire magneto line from SB-86/P, AN/TCC-7, TA-43/PT or TA-312/PT (20 Hz signaling) | 2W | AC |
| 2-wire vf line (no signaling) | 2W | OFF |
| 4-wire line (tone signaling) | 4W | OFF |

(3) Loosen the captive screws and remove the perforated inner front cover.

(4) Operate the POWER switch to ON.

(5) Check to see that the 20~ indicator on panel 18A2 is glowing.

NOTE

Subparagraphs (6) and (7) below do not apply to CV-1548A/G.

(6) Operate the meter selector switch through -, +, 20~, and 20~ DRIVE, and check for a yellow area indication on the TEST ALIGN meter.

(7) Operate the meter selector switch to 1600~ and check for a green area indication on the TEST ALIGN meter. If necessary, adjust the ADJ 1600 control on panel 18A2 for a center indication in the green area.

i. Line Polarity Checks Between CV-1548/G and AN/TTC-7.

(1) *Local battery (LB) line.* In each panel 18A3 of the CV-1548/G connected to a LB line, press the TEST switch; if an incoming call does not register at the switchboard for the associated line, interchange the tip and ring wires.

(2) *Common battery (CB) line (terminate (TE) only).* For each panel 18A3 of the CV-1548/G connected to a terminate CB line, disconnect the CX-7870/G cables between the CV-1548/G and the TD-352/U. An incoming call will register on the switchboard for each channel. If the call indication does not disappear when the TEST switch is pressed, interchange the tip and ring wires.

NOTE

Tip and ring wire polarity is not significant between the AN/TTC-7 originate (OR) trunks and the CV-1548/G.

j. Line Polarity Checks Between CV-1548/G and SB-86/P.

(1) On each panel 18A3 of the CV-1548/G connected to an SB-86/P circuit, operate the signaling mode switch to OR. Operate the line selector switch to T in each line of the SB-86/P connected to the CV-1548/G, and pull down all cords on the SB-86/P.

(2) Interchange the tip and ring wires on each line that shows a white line indicator on the SB-86/P.

(3) Operate the signaling mode switch on each panel 18A3 of the CV-1548/G and the switches of the SB-86/P as indicated below.

| <i>Type of 2-wire line connection from SB-86/P</i> | <i>CV-1548/G signaling mode switch</i> | <i>SB-86/P switch</i> | |
|--|--|-----------------------|-----------------|
| | | <i>Line selector</i> | <i>CIV TRKS</i> |
| Civilian trunk | OR | M | ON |
| Trunk | TE | C | OFF |
| Magneto | AC | M | OFF |

(4) Replace the perforated inner front cover of

the CV-1548/G and secure it in place with the screws.

k. Radio Set AN/GRC-50A(V) Components.

(1) Check to see that the proper receiver and transmitter heads are installed as assigned for the assemblage.

(2) If the AN/GRC-50A(V) is connected in an operating system, and the antennas are installed, erected, and connected, turn on the AN/GRC-50A(V) and tune it; follow the procedures in paragraph 3-4.

(3) If the AN-GRC-50A(V) is not connected in an operating system, connect a CG-718B/U between the TO ANT receptacle on the T-893(P)/GRC and Dummy Load, Electrical DA-189/GRC on top of the equipment rack (B, fig. FO-1) and tune it by following the procedures in paragraph 3-4.

NOTE

If no operating frequencies have been assigned to the standby components, tune them to the same frequencies as the operating components.

(4) Reconnect the TO ANT receptacle on the T-893(P)/GRC to the DA-189/GRC.

(5) Operate the R-1331(P)/GRC meter selector switch to TEST TONE CAL.

(6) Operate the R-1331(P)/GRC TEST TONE switch to ON and adjust the TEST TONE control for an indication of 25 on the multimeter.

(7) Operate T-893(P)/GRC multimeter selector switch to 1 KC MOD and check for a green area indication on the multimeter.

NOTE

AFC must be properly tuned for this indication.

l. AN/GRC-50(V) Order Wire Adjustment. Perform the following procedures only on operating components.

(1) Operate the PP-2054/GRC OPERATE-STANDBY switch to STANDBY. Disconnect the CG-718B/U between the TO ANT receptacle and the DA-189/GRC. Reconnect the antenna cable to the TO ANT receptacle.

(2) Operate the PP-2054/GRC OPERATE-STANDBY switch to OPERATE.

(3) Operate the R-1331(P)/GRC multimeter selector switch to 1 KC OUT.

(4) Contact the next terminal or repeater in the radio link on the order wire and request a 1,000-Hz tone at 1 milliwatt (0 dBm).

(5) Adjust the FDM OUTPUT LEVEL control on the R-1331(P)/GRC for a green area indication on the meter.

(6) Operate the multimeter selector switch to

ORDERWIRE and check the meter for a green area indication.

m. Antenna Orientation (One AT-903/G).

NOTE

These adjustments are for azimuth correction only. Two persons are required to perform the adjustment. Elevation angle adjustments must be made before the mast is raised.

(1) Contact the operator at the next terminal or repeater in the radio link.

NOTE

The following procedures should be performed simultaneously by the operators at both stations.

(2) Operate the R-1331(P)/GRC multimeter selector switch to REC SIGNAL.

(3) Press the AFC DISABLE switch and adjust the OSC control for a peak indication on the meter. Alternately adjust the REG SIG 1 and REC SIG 2 controls until a peak indication is obtained.

(4) Adjust the position of the antenna by having one person rotate the mast 15 degrees from the original position, in both directions, while the second person observes the indication on the meter. Position the mast for a maximum indication on the meter.

(5) Repeat (4) above at both sites until the maximum received signal is obtained.

(6) Tighten the snubbers on all antenna guy wires and secure them.

(7) Operate the R-1331(P)/GRC multimeter selector switch to OSC and adjust the WAVE-METER control for a maximum meter indication.

(8) Check the reading on the WAVEMETER DIAL and compare it to the reading in the WAVEMETER CHART for the assigned receiver channel. If it is more than two divisions from the designated reading on the chart, notify the distant terminal or repeater site to retune their transmitter (para 3-4d or e).

n. Antenna Orientation (Two AT-903/G's on AB-957/GRC).

(1) Perform the procedures in *l* above for the fixed AT-903/G on AB-957/GRC.

(2) Secure the four guy wires attached to the guy attachments on the AB-957/GRC to GP-112/G stakes keeping the two guys (two per end of AB-957/GRC) separated by approximately 90 degrees. Tighten the guys enough to hold them in position; do not overtighten.

(3) Point the movable AT-903/G (using the guys attached) in the approximate direction of the distant station.

(4) Contact the operator at the next terminal or repeater site in the radio link using the orderwire facilities.

(5) Perform the procedures in *l*(2) through (5) above using the attached guys to rotate the AT-903/G. Do not rotate the mast.

(6) Secure the guys attached to the AT-903/G to GP-112/G stakes driven into the ground so that the two guys form an angle of between 120 and 150 degrees.

(7) Tighten the snubbers to secure the AT-903/G in position; do not overtighten.

(8) Repeat the above steps for all sites in the radio link utilizing two AT-903/G's on the AB-957/GRC.

o. TSEC/KG-27.

NOTE

Before the secure equipment is placed in the system, it is imperative that the system is operating reliably in the non-secure mode.

(1) Refer to paragraph 2-11*b*(1) through (8) for TSEC/KG-27 setup procedures.

(2) Turn on the TSEC/KG-27; the power lamp should light.

2-15. Preinstallation Checks

NOTE

Never install equipment in a system which does not check out in loopback checks.

a. General. Preinstallation checks are performed to ensure that equipment components are operating properly before being installed in the communications system. The AN/TRC-117(*) components can be cabled in a number of ways to provide for several operating systems. Follow the procedures in *c* below when the AN/TRC-117(*) is operating as a radio terminal system, *d* below for a radio/cable conversion system, *e* below for a cable terminal system and *f* below for a radio relay system.

b. Loopback Checks. Output circuits of the pcm components may be looped back to the input circuits to verify isolation of trouble in a system. The loopback checks must be coordinated with the distant terminal or repeater whenever possible. Determine which side of the component to check, perform the special conditions, and connect the cables as required. Check the component by operating the METER SELECT switch through its positions (table 4-1) and observing the various indications. When the loopback checks are complete, reconnect the cables for system requirements.

NOTE

If a CX-11230/G transmission cable is

used, disconnect the CX-11230/G from CX-10734/G adapter and connect the free ends of the CX-10734/G together to perform the loopback checks. If a CX-4245/G transmission cable is used, disconnect the CX-4245/G from the VIDEO ENTRANCE BOX and use two CX-10734/G to perform the loopback checks by connecting one CX-10734/G to the VIDEO ENTRANCE BOX. Connect this CX-10734/G to another CX-10734/G that has its ends connected together.

c. An/TRC-117() Radio Terminal System.*

(1) Radio terminal set multiplex equipment (TD-202/U, TD-204/U and TD-352/U) will be checked for proper operating voltages (para 2-14).

(2) Multiplex equipment will be checked by loopback for frame and channel quality before installation in a radio or cable system.

(3) Loopback test 1:

(a) Operate the TD-202/U OPR-TEST switch to TEST.

(b) Operate the TD-202/U TRAFFIC SEL switch to 12 for 12-channel operation; 24R for 24-channel operation.

(c) Connect the cables between the TD-202/U and TD-352/U as shown in figure 2-47 for 12-channel nonsecure operation and figure 2-48 for 24-channel nonsecure operation and in figure 2-57 for 12-channel secure operation and figure 2-58 for 24-channel secure operation.

(d) Operate the TD-202/U METER SELECT switch to TO RADIO XMTR and adjust the OL control (5A2 panel) for a hairline indication on the TEST ALIGN meter.

(e) Operate the TD-202/U METER SELECT switch to FROM RADIO RCVR and adjust the RL control (5A3 panel) for a hairline indication on the TEST ALIGN meter.

(f) The CL adjustment is made for 24-channel operation only.

1. Operate the TD-202/U METER SELECT switch to SERV FAC.

2. Operate the TD-202/U SERV SEL switch on the side of the TD-202/U to position C and adjust the CL control (5A3 panel) for maximum indication on the TEST ALIGN meter.

(g) One TD-352/U (12 channels) or both TD-352/U's (24 channels) must frame; FRAME ALARM indicator is extinguished.

(h) The TRAFFIC lamp on the TD-202/U front panel must be extinguished.

(4) Loopback test 2.

(a) With the cables connected and switches set as in loopback test 1;

1. Remove the three audio cables from the

Special Conditions

| Component | System side | Special conditions | Connections | |
|----------------|-------------------------|--------------------|--|------------------------|
| | | | From | To |
| TD-204/U | PCM..... Cable | None | PCM OUT-1 TO CABLE | PCM IN-1 FROM CABLE |
| TD-352/U | PCM..... | None | PCM OUT 12 CH TIM..... OUT | PCM IN TIM IN |

AUDIO CHANNELS connectors located on the front of the TD-352/U(s).

2. Remove the headset/handset from the TALK-MONITOR connector located on the front panel of the TD-352/U.

(b) Set the 2W/4W switch on the TD-352/U(s) to the 2W position.

(c) TD-352/U Channel gain adjustments:

1. Operate the TD-352/U METER SELECT switch to SERV FAC.

2. Operate the TD-352/U SERV SEL switch to the OSC position and adjust the OSC ADJUST control for a hairline indication on the TEST ALIGN meter.

3. Operate the TD-352/U SERV SEL switch to the CHAN 1-12 (straight up) position.

4. Operate the TD-352/U CHAN 1-12 switch to the channel 1 position.

5. While observing the TEST ALIGN meter, adjust the Channel Modem 1 AG control for a hairline indication.

6. Repeat 4 and 5 above for channels 2-12.

(d) Operate the TD-352/U SERV SEL switch to the PHONE position.

(e) Operate the TD-352/U CHAN 1-12 switch to channel 1 and monitor the channel with the headset/handset connected to the TALK-MONITOR connector; there shall be no noise on the channel when monitored.

(f) Repeat (e) above for channel 2-12.

(g) Repeat (b) through (f) above for the SLAVE TD-352/U; 24-channel operation only.

(h) Operate the TD-220/U OPR-TEST switch to the OPR position.

(5) Remove the cable connected to the TEST jack on the TD-202/U and connect it to the PCM OUT jack on the R-1331(P)/GRC.

(6) Loopback test 3.

(a) Disconnect the CG-409H/U cable from the PCM IN jack on the T-893(P)/GRC.

(b) Following the procedures as outlined in paragraph 3-2, tune the T-893(P)/GRC to the assigned frequency (channel).

(c) Following the procedures as outlined in

paragraph 3-4, tune the R-1331(P)/GRC to 120 channels above the transmit channel.

(d) Connect cable CG-409H/U, between the TD-202/U to RADIO XMTR jack and the PCM IN jack on the T-893(P)/GRC.

(e) Operate the TD-202/U SERV FAC to the RADIO XMTR position and adjust the OL control (5A2 panel) for a hairline reading on the TEST ALIGN meter.

(f) Operate the T-893(P)/GRC MULTI-METER SELECTOR switch to the PCM IN position and adjust the PCM LEVEL control for an indication in the green area on the meter; the PCM LEVEL control pointer should point straight up.

NOTE

A position higher than "M" in PCM or lower than "P" indicates a defective transmitter.

(g) Operate the METER switch on R-1331(P)/GRC to PCM OUT. The reading must be in the green area on the TEST ALIGN meter.

(h) Operate the TD-202/U METER SELECT switch to FROM RADIO RCVR and adjust the RL control (5A3 panel) for a hairline reading on the TEST ALIGN meter.

(i) Operate the TD-202/U Meter SELECT switch to SERV FAC; operate the SERV SEL switch to position C and adjust the CL control (5A3 panel) for a maximum reading on the TEST ALIGN meter; 24-channels only.

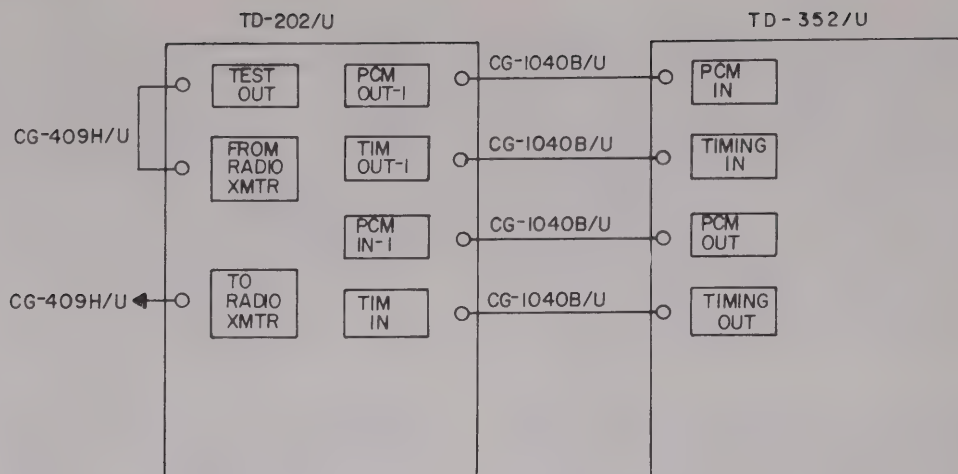
(j) The TD-352/U (12 channels) or both TD-352/U's (24 channels) must frame and all channels must be quiet when monitored.

(k) Operate the PP-2054/GRC OPERATE-STAND BY switch to STAND BY.

(l) Retune the R-1331 (P)/GRC to the assigned receive channel (para 3-4).

(m) Operate the PP-2054/GRC OPERATE-STAND BY switch to OPERATE.

d. *Pre-Installation Checks—AN/TRC-117(*) Radio To/From Cable Conversion System.*



NOTES: 1. ☐ INDICATES EQUIPMENT MARKING

2. TD-202/U SWITCH SETTING

OPR-TEST - TEST
TRAFFIC SEL - 12

3. TD-352/U SWITCH SETTINGS

ADDRESS MASTER/SLAVE - MASTER
2 WIRE/4 WIRE - 2 WIRE
AUX - OUT

EL3TT039

Figure 2-47. Radio terminal, 12-channel interunit connection loopback diagram.

NOTE

The TD-352/U's in the AN/TRC-117(*) are not used when a radio-to-cable configuration is used. Channelization is obtained through the use of a carrier terminal such as the AN/TCC-60, AN/TCC-61, or other carrier terminal. Loopback checks as performed in paragraph 2-15 apply with the addition of two TD-204/U's in the system.

(1) Radio terminal set multiplex equipment (TD-202/U, TD-204/U) will be checked for proper operating voltages (para 3-5).

(2) Radio terminal set equipment will be checked by loopback for frame and channel quality before installation in a radio or cable system.

(3) Contact the carrier terminal operator on the order wire and insure that loopback checks have been performed on this multiplex equipment.

(4) *Loopback test 4.*

(a) Connect multiplex equipment as shown in figure 2-49 for 12-channel operation or figure 2-50 for 24-channel operation.

(b) Operate the TD-202/U OPR-TEST switch to TEST.

(c) Connect a CG-409H/U cable between the TD-202/U TEST and FROM RADIO RCVR jacks on the front panel.

(d) Operate the TD-202/U TRAFFIC SEL

switch to 12 for 12-channel operation; 24R for 24-channel operation.

(e) Operate the TD-204/U TRAFFIC SEL switch to 12 for 12-channel operation; 48AR for 24-channel operation.

(f) For systems using 1 mile or less of video cable between the carrier terminal and the AN/TRC-117(*), proceed to (m) below. For systems using more than 1 mile of video cable, perform (g) through (q) below.

(g) Operate the TD-204/U MILE switches on panels 6A4 and 6A5 to the position which corresponds to the distance to the first TD-206/G in the transmission cable.

(h) Operate the TD-204/U CABLE POWER switch to ON.

(i) Operate the TD-204/U METER SELECT switch to CABLE I. The indication on the TEST ALIGN meter of the TD-204/U must be in the yellow area.

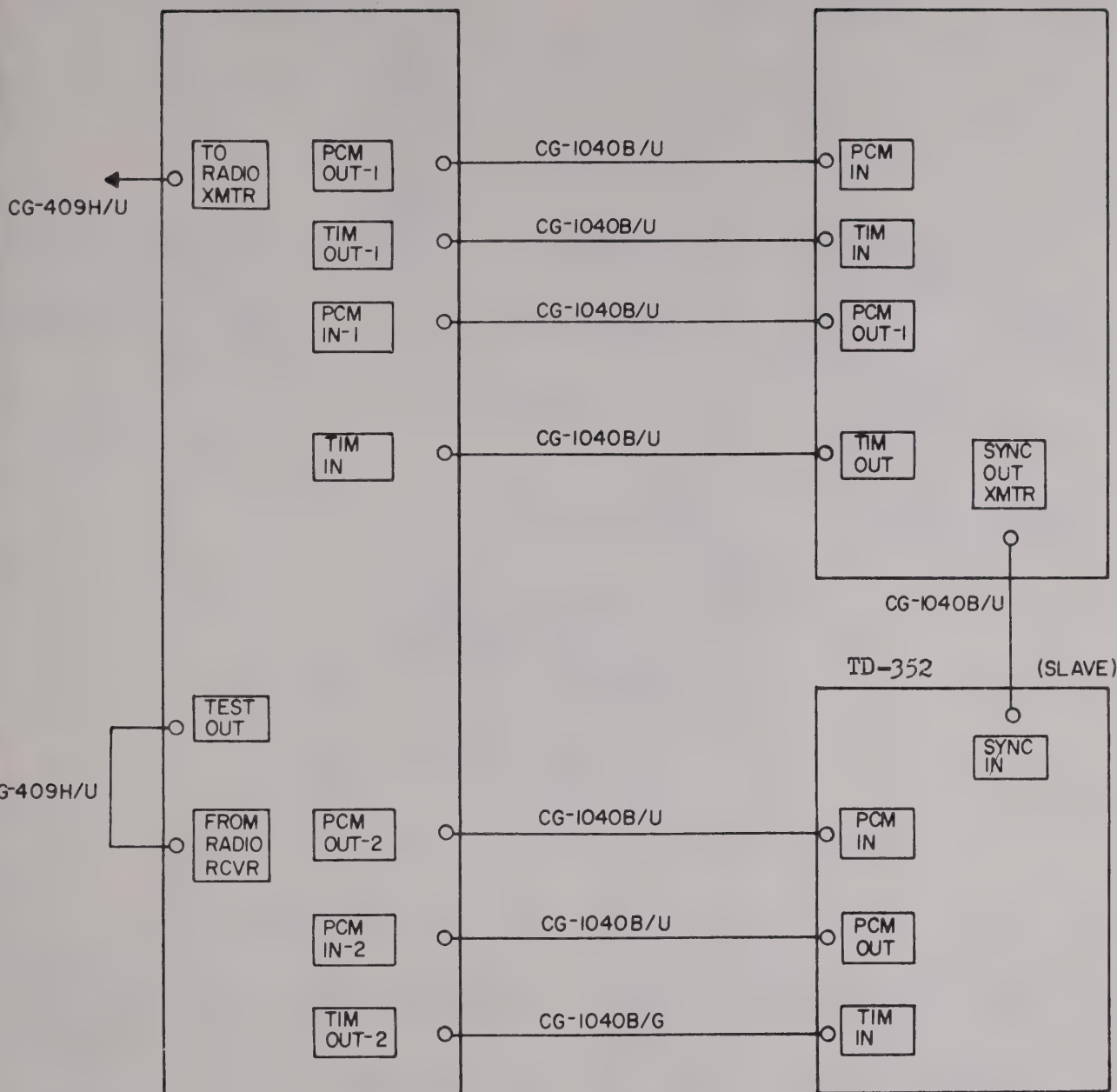
(j) Operate the TD-204/U METER SELECT switch to CABLE V. The TEST ALIGN meter of the TD-204/U must read 10.8 times the number of TD-206/G's in the system, plus 13.

(k) Operate the TD-204/I METER SELECT switch to SERV FAC.

(l) Operate the TD-204/U SERV SEL switch to the RCC position. The indication on the TEST ALIGN meter must be in the green area.

TD-202/U

TD-352 (MASTER)

NOTES: 1 INDICATES EQUIPMENT MARKINGS

2. TD-202/U SWITCH SETTINGS

OPR-TEST - TEST

TRAFFIC SEL - 24

3. TD-352/U SWITCH SETTINGS

ADDRESS MASTER/SLAVE - MASTER(MASTER TD-352/U)

- SLAVE(SLAVE TD-352/U)

2 WIRE/4 WIRE - 2 WIRE

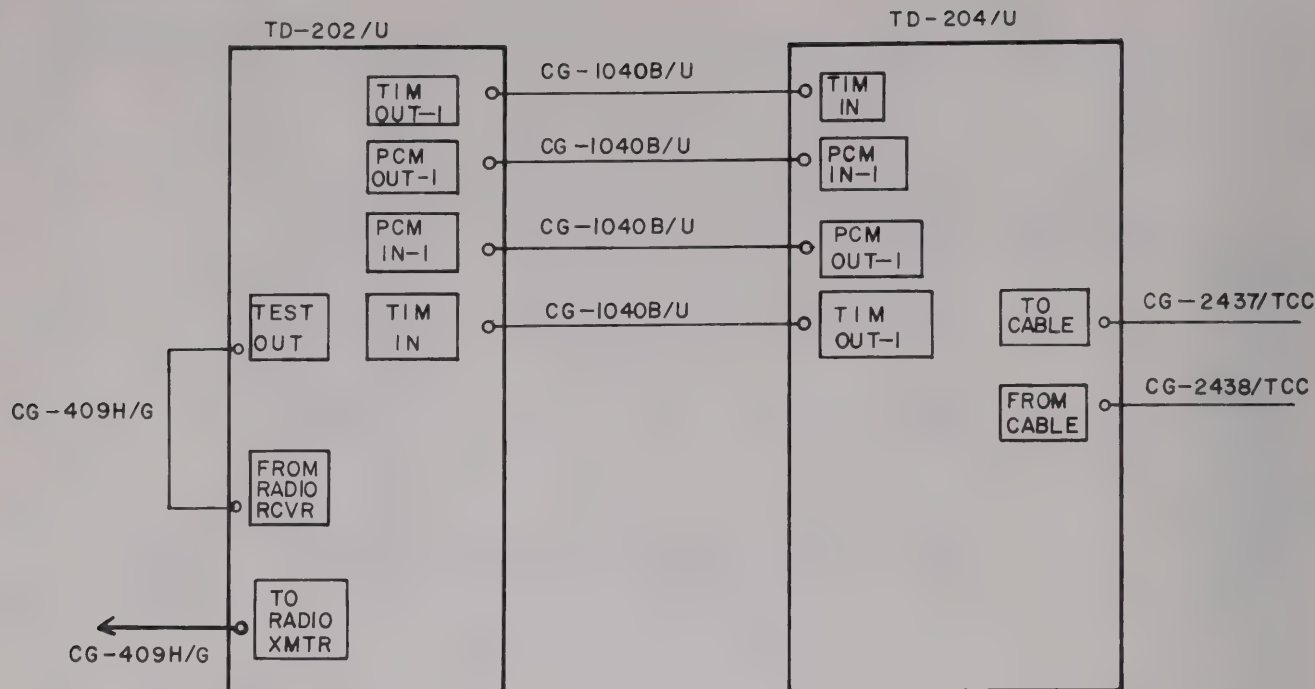
AUX OUT

EL3TT040

Figure 2-48. Radio terminal, 24-channel interunit connection loopback diagram.

(m) Operate the TD-202/U METER SELECT switch to TO RADIO XMTR and adjust the OL control (5A2 panel) for a hairline reading on the TEST ALIGN meter.

(n) Operate the TD-202/U METER SELECT switch to FROM RADIO RCVR and adjust the RL control (5A3 panel) for a hairline reading on the TEST ALIGN meter.



- NOTES: 1. INDICATES EQUIPMENT MARKING
2. TD-202 /U SWITCH SETTINGS
- | | |
|---------------------|--------|
| OPR-TEST | — TEST |
| TRAFFIC SEL (12/24) | — 12 |
3. TD-204/U SWITCH SETTINGS
- | | |
|---------------|------------|
| NORM OPR-ZERO | — NORM OPR |
| SET READ | |
| TRAFFIC SEL | — 12 |

EL3TT041

Figure 2-49. Radio to/from cable conversion, 12-channel interunit connection loopback diagram.

(o) The TD-202/U CL adjustment is performed for 24-channel systems only.

1. Operate the TD-202/U METER SELECT to SERV FAC.

2. Operate the TD-202/U SERV SEL switch to position C.

3. Adjust the CL control (5A3 panel) for a maximum indication on the TEST ALIGN meter.

(p) The TRAFFIC lamps on the TD-202/U and TD-204/U multiplexers must be extinguished.

(q) Contact the carrier terminal operator on the orderwire to have the equipment checked.

1. The TD-204/U TRAFFIC lamp must be extinguished.

2. One TD-352/U (12 channels) or both TD-352/U's (24 channels) must be in frame and all channels must be quiet.

NOTE

For systems using 1 mile or less of transmission cable, the MILE switches on the

6A4 and 6A5 panels in the TD-204/U can be altered to settings which will provide quiet channels at the carrier terminals multiplex equipment. This applies to loopback tests only.

(r) Operate the TD-202/U OPR-TEST switch to the OPR position.

(s) Remove the CG-409/U cable from the TEST jack on the TD-202/U and connect it to the PCM OUT jack on the R-1331(P)/GRC.

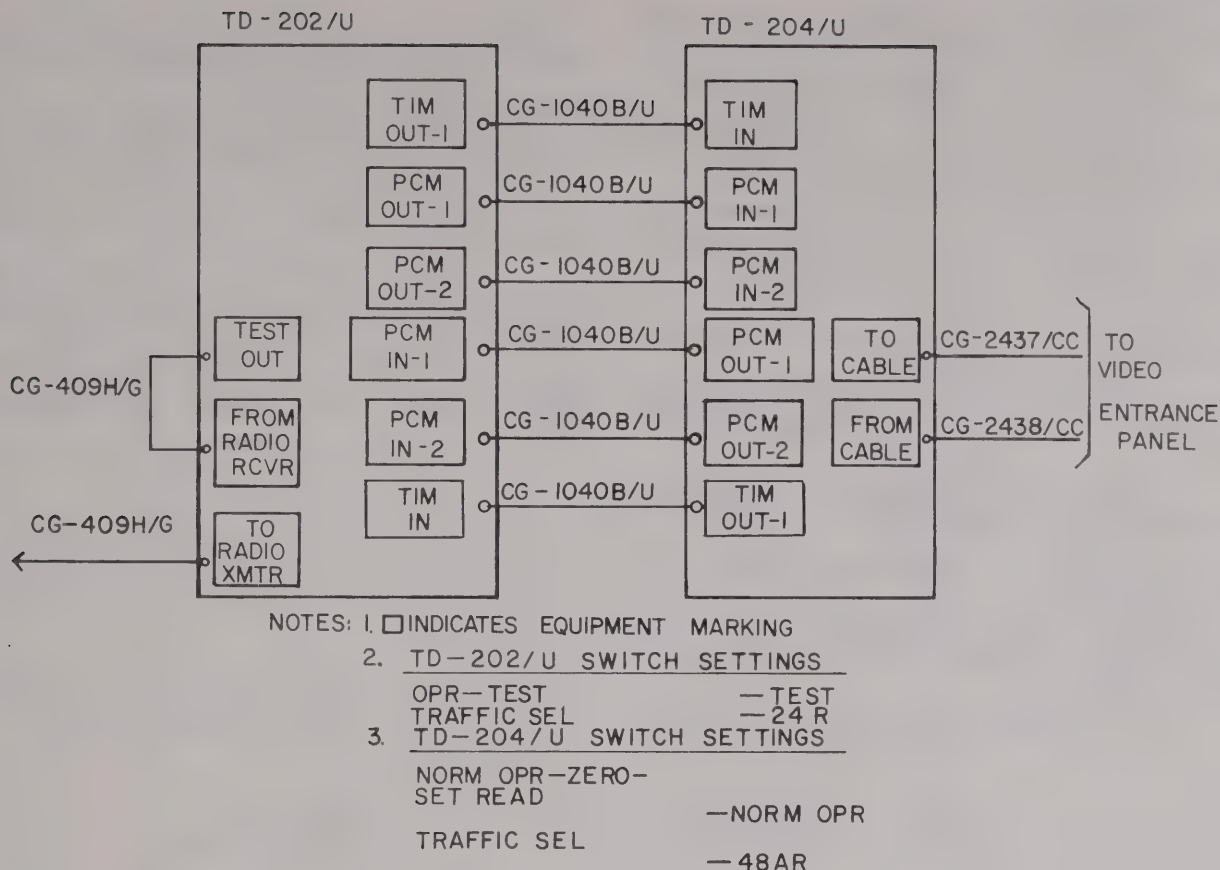
(5) *Loopback test 5.*

(a) Maintain the connection and settings of loopback test 4 above.

(b) The TD-204/U MILE switch setting of panels 6A4 and 6A5 will be set for system operation as follows:

1. 6A5 panel—1 mile for systems with 1 mile or less of transmission cable.

2. 6A4 panel—to the position which corresponds to the length of transmission cable ($\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$, or 1 mile).



EL3TT042

Figure 2-50. Radio to/from cable conversion, 24-channel interunit connection diagram.

3. 6A5 panel—to the position which corresponds to the distance to the first TD-206/G ($\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$, or 1 mile).

4. 6A4 panel—to the position which corresponds to the distance to the first TD-206/G ($\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$, or 1 mile).

(c) Disconnect the CG-409H/U cable from the PCM IN jack on the T-893(P)/GRC.

(d) Following the procedures outlined in paragraph 3-4, tune the T-893(P)/GRC to the assigned channel.

(e) Following the procedures outlined in paragraph 3-4, tune the R-1331(P)/GRC to 120 channels (image frequency) above the transmit channel.

NOTE

If the assigned transmit channel is too high to allow tuning the receiver 120 channels above the transmit channel, a test transmit channel must be selected to allow tuning the receiver to the image frequency.

(f) Connect a CG-409H/G cable between

the TD-202/U TO RADIO XMTR jack and the T-893(P)/GRC PCM IN jack.

(g) Operate the TD-202U METER SELECT switch to the TO RADIO XMTR position and adjust the OL control (5A2 panel) for a hairline indication on the TEST ALIGN meter.

(h) Operate the T-893(P)/GRC multimeter selector switch to PCM IN and adjust the PCM LEVEL control for an indication in the green area on the multimeter; the PCM LEVEL control pointer should not point to the right of a straight up (vertical) position.

(i) Operate the R-1331(P)/GRC MULTIMETER SELECTOR switch to PCM OUT and look for a green indication on the TEST ALIGN meter.

(j) Operate the TD-202/U METER SELECT switch to the FROM RADIO RCVR position and adjust the RL control (5A3 panel) for a hairline indication on the TEST ALIGN meter.

(k) The CL adjustment is made for 24-channel operation only.

1. Operate the TD-202/U METER
SELECT switch to SERV FAC.

2. Operate the TD-202/U SERV SEL switch to position C.

3. Adjust the CL control (5A3 panel) for a maximum reading on the TEST ALIGN meter.

(l) The TRAFFIC lamps on the TD-202/U and TD-204/U multipliers must be extinguished.

(m) Contact the carrier terminal operator on the order wire and request that the equipment be checked for proper operating indications and to be sure that all channels are quiet.

(n) Operate the PP-2054/GRC OPERATE-STANDBY switch to STANDBY.

(o) Following the procedures in paragraph 3-4, retune the receiver to the assigned receive channel.

(p) Operate the PP-2054/GRC OPERATE-STANDBY switch to OPERATE.

e. *Pre-Installation Checks* — AN/TRC-117(*) Cable Terminal System.

(1) Radio terminal set multiplex equipment (TD-204/U, TD-352/U(s)) will be checked for proper voltages (para 3-5).

(2) Radio terminal set multiplex equipment

will be checked by loopback for frame and channel quality before installation in a radio or cable system.

(3) *Loopback test* 6.

(a) Connect multiplex equipment as shown in figure 2-51 for 12-channel operation or figure 2-52 for 24-channel operation.

(b) Operate the TD-204/U CABLE POWER switch to OFF.

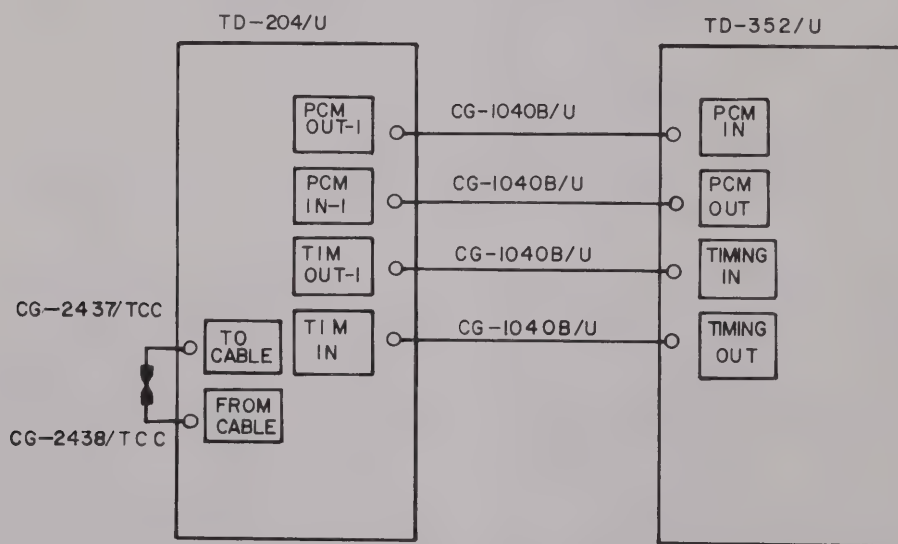
(c) Connect one end of loopback cable (CG-2437/G) to the TO CABLE connector on the TD-204/U.

(d) Connect one end of loopback cable (CG-2438/G) to the FROM CABLE connector on the TD-204/U.

NOTE

These cables have polarized connectors and must not be forced for connections. Match the female and male connectors for proper fit.

(e) Connect the two free ends of loopback cables (CG-2437/G and CG-2438/G) together.



- NOTES: 1. INDICATES EQUIPMENT MARKING
2. TD-204/U SWITCH SETTINGS

NORM OPR-ZERO- — NORM OPR
SET READ

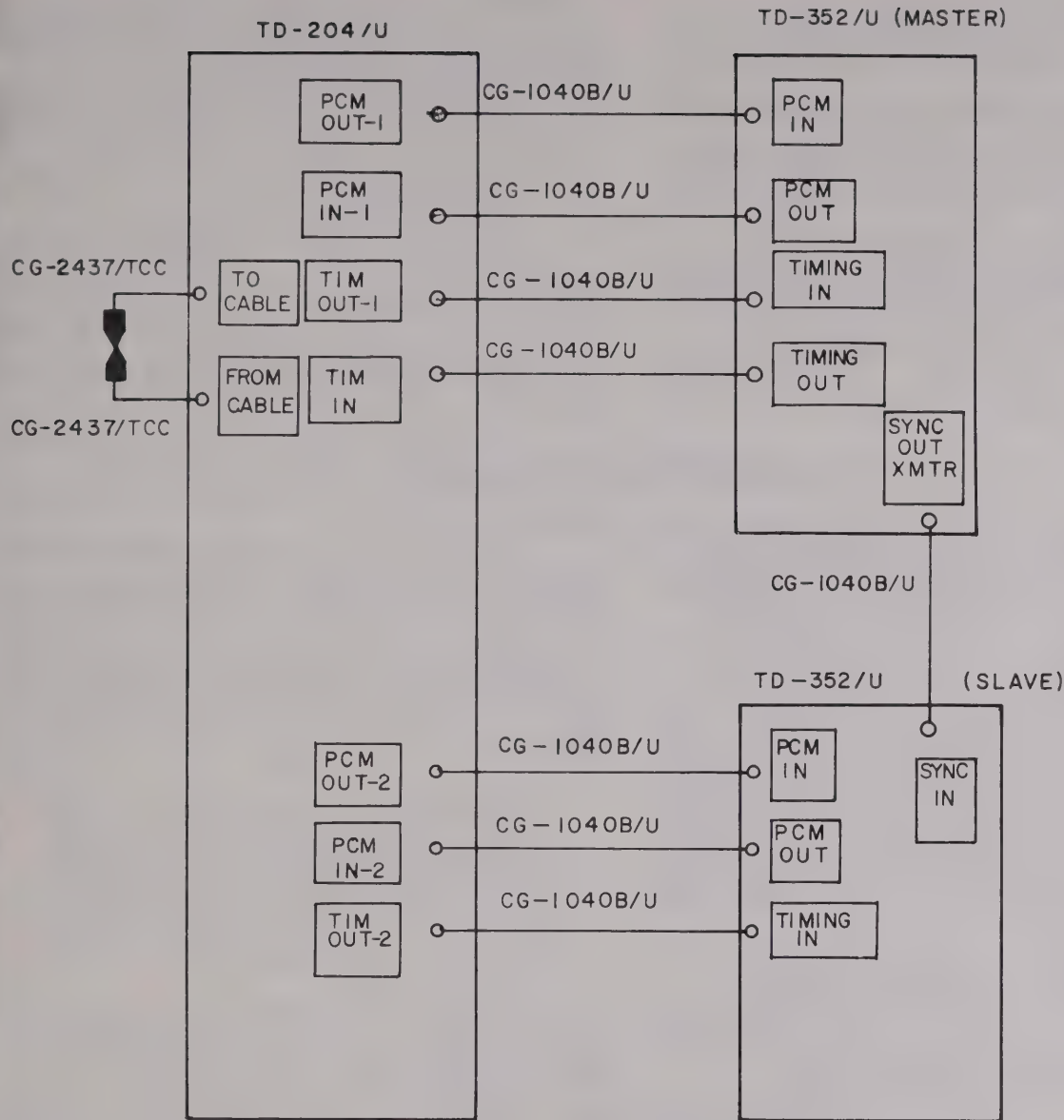
TRAFFIC SEL — 12

3. TD-352/U SWITCH SETTINGS

ADDRESS MASTER/SLAVE — MASTER
2 WIRE / 4 WIRE — 2 WIRE
AUX OUT

EL3TT043

Figure 2-51. Cable terminal, 12-channel interunit connection loopback diagram.



- NOTES:
1. INDICATES EQUIPMENT MARKING
 2. TD-204/U SWITCH SETTINGS
 NORM OPR-ZERO-
 SET READ
 TRAFFIC SEL
 3. TD-352/U SWITCH SETTINGS
 ADDRESS MASTER/SLAVE
 2 WIRE/4 WIRE
 AUX
- NORM OPR
 -24
 MASTER (MASTER TD-352/U)
 SLAVE (SLAVE TD-352/U)
 -2 WIRE (BOTH)
 OUT (BOTH)

EL3TT044

Figure 2-52. Cable terminal, 24-channel interunit connection loopback diagram.

(f) Operate the TD-204/U MILE switches on the 6A4 and 6A5 panels to the $\frac{1}{2}$ mile position.

NOTE

The MILE switches on panels 6A4 and 6A5 may be changed from $\frac{1}{2}$ mile positions to

obtain channel quietness during loopback checks only, however combination of the settings must equal 1 mile.

(g) Operate the TD-204/U TRAFFIC SEL switch to 12 for 12-channel operation; 24 for 24-channel operation.

(h) One TD-352/U (12-channels) or both TD-352/U's (24-channels) must frame.

(4) *Loopback test 7.*

(a) Maintain loopback test 6 connections and switch setting.

(b) Remove the three audio cables from the AUDIO CHANNELS connectors on the front panel of the TD-352/U(s).

(c) Remove the headset/handset from the TALK MONITOR connector on the front panel of the TD-352/U.

(d) Set the 2W/4W switches on the TD-352/U (side) to the 2W position.

(e) Make channel gain adjustments as follows:

1. Operate the TD-352/U METER SELECT switch to SERV FAC.

2. Operate the TD-352/U SERV SEL switch to the OSC position and adjust the OSC ADJUST control for a hairline indication on the TEST ALIGN meter.

3. Operate the TD-352/U SERV SEL switch to the CHAN 1-12 (straight up) position.

4. Operate the TD-352/U CHAN 1-12 switch to the channel 1 position.

5. While observing the TEST ALIGN meter, adjust the Channel Modem one AG control (2A2 panel) for a hairline indication.

6. Repeat 4 and 5 above for channels 2-12.

(f) Operate the TD-352/U SERV SEL switch to the PHONE position.

(g) Connect the headset/handset to the TALK MONITOR connector on the TD-352/U.

(h) Operate the TD-352/U CHAN 1-12 switch to CHAN 1 and monitor the channel with the headset/handset; there must be no noise.

(i) Repeat (h) above for channels 2-12.

(j) Repeat (b) through (i) above for the SLAVE TD-352/U; 24-channel operation.

(k) Reconnect the audio cables to the TD-352/U AUDIO CHANNELS connectors.

(l) Remove the TD-204/U loopback cables from the TO CABLE and FROM CABLE connectors.

(m) The TD-204/U MILE switches on panels 6A4 and 6A5 be set for system operation as follows:

1. For systems with 1 mile or less of transmission cable: 6A4 panel—To the position which corresponds to the actual length of transmission cable being used ($\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$, or 1 mile). 6A5 panel—To 1 mile regardless of the length of transmission cable being used.

2. For systems with 1 or more miles of transmission cable: 6A4 and 6A5 panels—To the position which corresponds to the distance from the assemblage to the first TD-206/G in the cable.

(n) Connect the system cables to the TO CABLE and FROM CABLE connectors located on the front panel of the TD-204/U.

(o) For systems using Pulse Power Restorer TD-206/G, operate the TD-205/U CABLE POWER switch to ON after verifying no one is working on the transmission line.

f. *AN/TRC-117(*) Radio Relay System.*

(1) Radio terminal set multiplex equipment (both TD-202/U's) will be checked for proper operating voltages (para 3-5).

(2) Cabling and switch settings:

(a) *12-channel system.* Prepare cabling and switch settings in accordance with figure 2-53.

(b) *24-channel system.* Prepare cabling and switch settings in accordance with figure 2-54.

(3) Connect the order-wire (O/W) cables as shown in figure 2-55.

(a) Operate the R-1331(P)/GRC TRAFFIC CHAN 12/24 or 4 switch to 4. This setting represents a 600-ohm impedance match at the REC binding posts.

(b) Operate the R-1331(P)/GRC FDM OUTPUT LEVEL control to mid-range (straight up) position.

NOTE

If the assigned transmit channel is too high to allow tuning the receiver 120 channels above the transmit channel, a test transmit channel must be selected to allow tuning the receiver to the frequency (120 channels above the transmit channel).

(4) Following the procedures as outlined in paragraph 3-4, tune the two T-893(P)/GRC transmitters to the assigned transmit channels.

(5) Following the procedures outlined in paragraph 3-4 tune the two R-1331(P)/GRC receivers to 120 channels above the transmit channel for each stack of equipment.

CAUTION

Observe the 30 MHz channel/frequency band (15 MHz on both sides of each channel/frequency) within which the receiver must NOT be tuned to the transmitter in the same stack or nearby radio set.

(6) Press the R-1331(P)/GRC RING button. The INCOMING CALL lamp will light and the BUZZER will sound.

(7) Remove the H-156/U handset from its holder.

(a) Monitor the orderwire; there should be no noise.

(b) Talk into the handset; sidetone should be heard and the side-tone should be of good quality.

(8) Operate the PP-2054/GRC OPERATE-STANDBY switch to the STANDBY position.

(9) Following the procedures in paragraph 3-4, retune the R-1331(P)/GRC receivers to the assigned receive channel.

NOTE

If the transmitters were tuned to a test channel, retune them to the assigned frequency (channel).

(10) Operate the PP-2054/GRC OPERATE-STANDBY to OPERATE.

(11) Connect the PCM signal cables as follows:

(a) One CG-409H/U between the TD-202/U TO RADIO XMTR connector and the PCM IN connector on the T-893(P)/GRC of the terminal A side stack.

(b) One CG-409H/U between the TD-202/U FROM RADIO RCVR connector and the PCM OUT connector on the R-1331(P)/GRC of the terminal A side stack.

(c) CX-7872/TCC (extractor cable) between the TD-202/U order wire connector and the R-1331(P)/GRC order wire connector.

(d) Repeat (a) through (c) above for the terminal B side stack.

Section V. SYSTEM ALIGNMENT

2-16. General

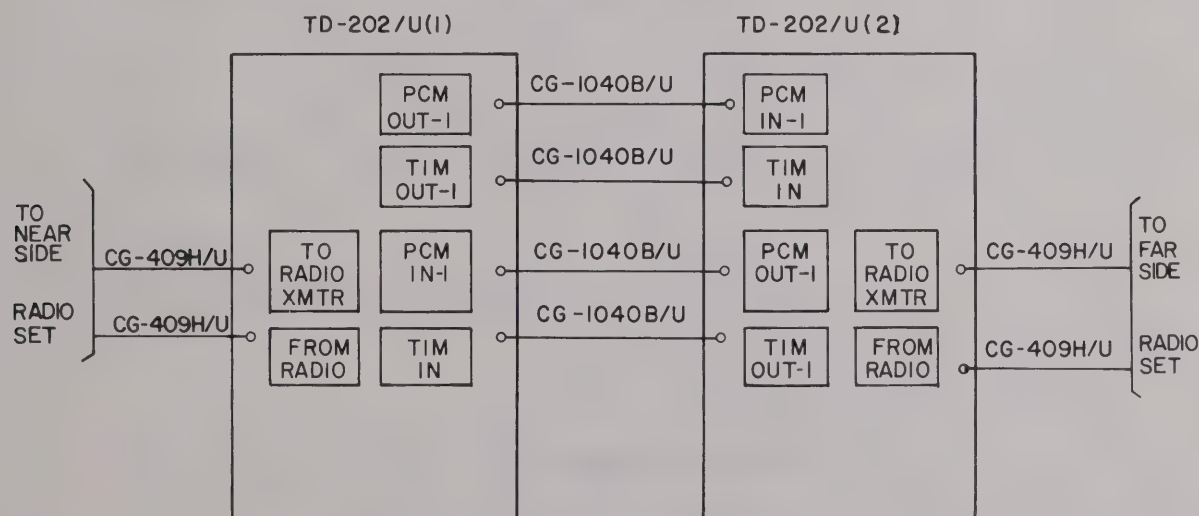
System lineup consists of checking the system signal levels from station to station in the system. The lineup is required to insure the system provides the optimum communications from terminal to terminal. The lineup procedures provide means for setting and checking receiving levels at all stations in the system.

NOTE

When system alignment is completed, record the meter readings for positions of

the multimeter selector switches and the positions of the other controls of the equipment in the system. These will be used for routine operations.

a. Control of System Lineup. All system procedures should be supervised by a designated system controller station in the system. During lineup procedures, intermediate stations will report completion of lineup procedures to the controller. The controller will then order the next station to begin the procedures.



NOTES: 1. INDICATES EQUIPMENT MARKING

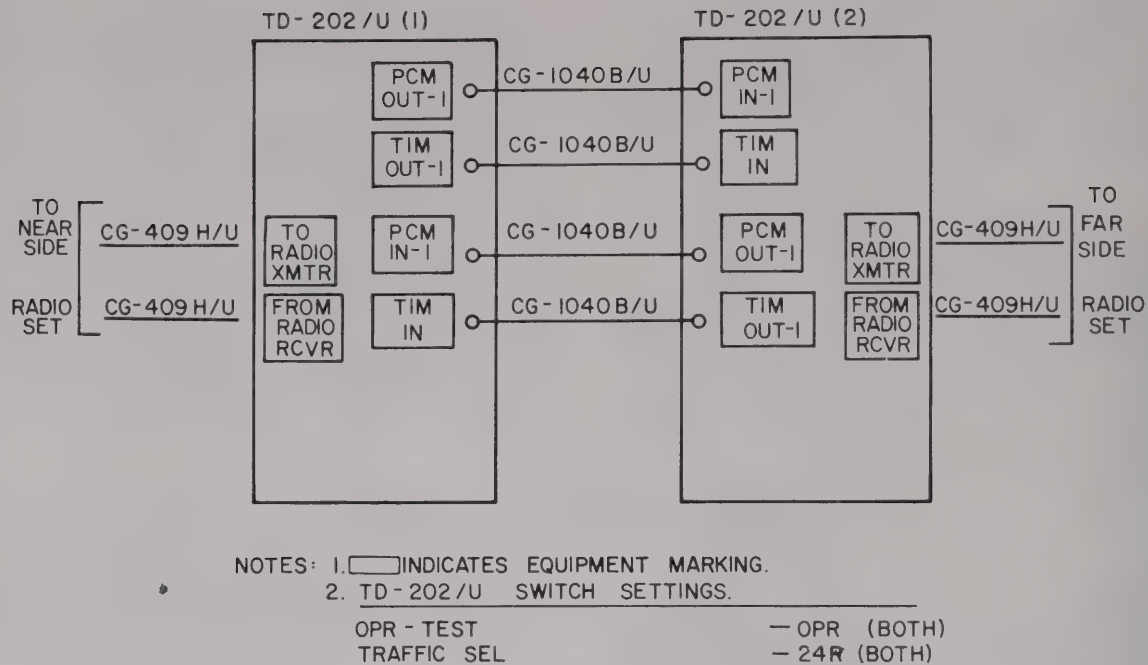
2. TD-202/U SWITCH SETTINGS

OPR-TEST
TRAFFIC SEL

— OPR (BOTH)
— I2 (BOTH)

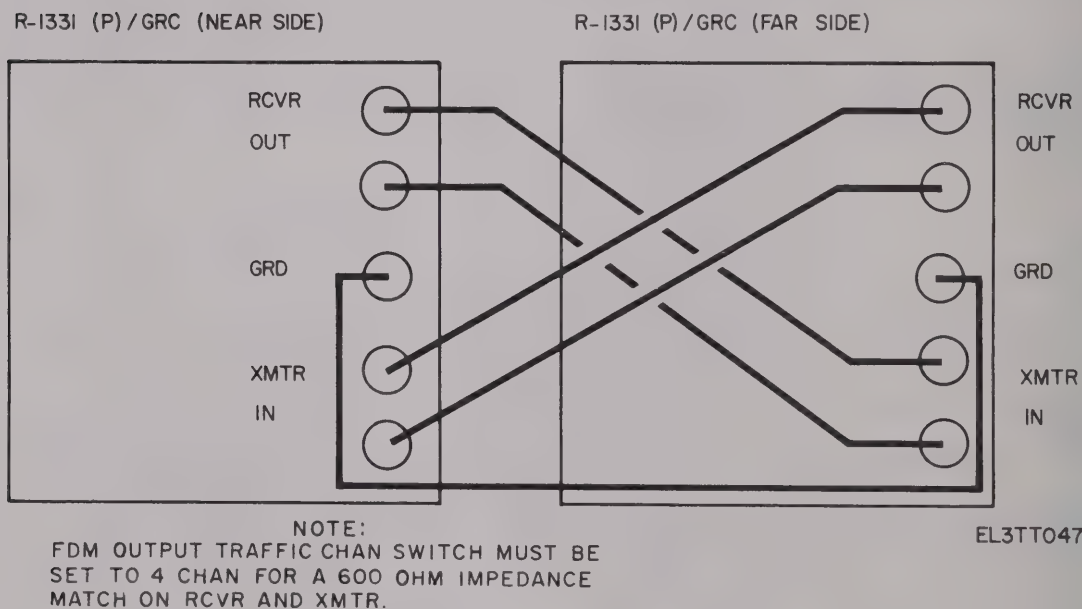
EL3TT045

Figure 2-53. Radio repeater/relay, 12-channel interunit connection loopback diagram.



EL3TT046

Figure 2-54. Radio repeater/relay, 24-channel, interunit connection loopback diagram.



EL3TT047

Figure 2-55. Radio repeater/relay strapover for orderwire diagram.

b. *General Lineup Procedures (fig. 2-56).* After radio contract has been established between all stations in the system, the controller will take charge of system alignment. This one person will order, one at a time, the proper step to be performed and get acknowledgment before proceeding to the next step.

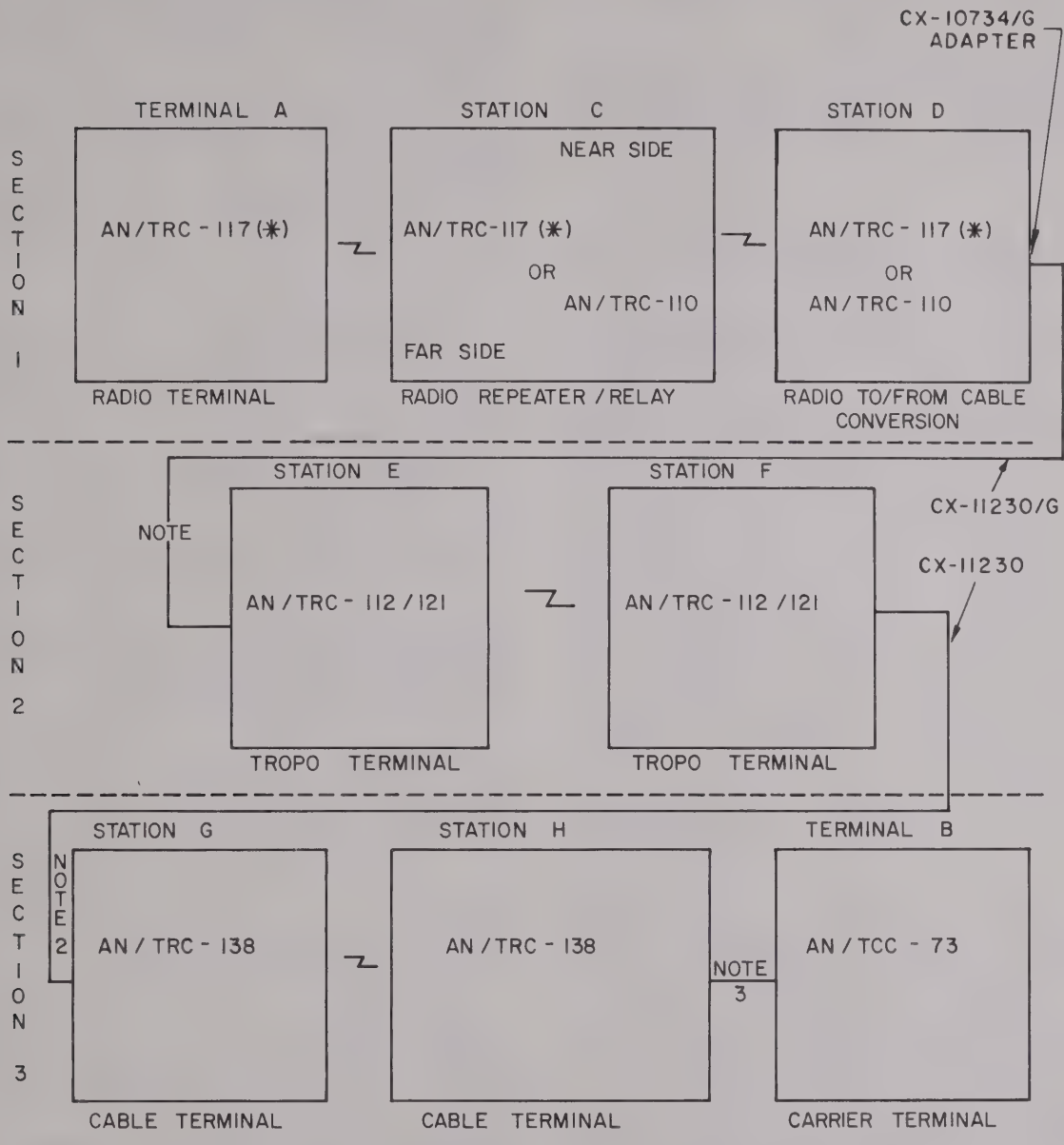
2-17. System Lineup

a. *Radio Link Orderwire.*

(1) *Preset and conditions.*

(a) Adjust FDM and PCM level controls at all stations to point straight up.

(b) Turn all TD-202 order wire level controls



- NOTES: 1. PERFORM THE VIDEO CABLE SWITCH SETTING IN ACCORDANCE WITH PARAGRAPH 2-12 E.
2. REFER TO THE AN/TRC-138 OR AN/TRC-112 TECHNICAL MANUALS FOR THE PROPER VIDEO CABLE SWITCH SETTINGS.
3. REFER TO THE AN/TCC-73 TECHNICAL MANUAL FOR PROPER VIDEO CABLE SWITCH SETTINGS.

EL3TTO48

Figure 2-56. Medium capacity pcm system block diagram.

to half-way between maximum clockwise and maximum counterclockwise.

(c) Connect FDM strap-over cables at all relay stations (fig. 2-55).

(d) All stations connect PCM and PCM order wire cables between the receiver and TD-202/U. Do not connect transmitter cables at this time.

(e) All stations press RCVR AFC Disable switch, multimeter selector switch to REC SIGNAL, adjust OSC for maximum, and peak REC SIG 1 and 2.

(f) Relays have to set R-1331(*)/GRC's FDM OUTPUT TRAFFIC CHAN switch to 4 and T-893(P)/GRC's INPUT LEVELS TRAFFIC CHAN switch to 4.

(2) *Step sequence of order wire lineup.*

(a) Terminal A is system controller and will notify all radio relay operators that order wire alignment is to begin.

(b) System controller will call off sequence of procedure and each operator will acknowledge as each step is completed.

(c) Terminal A must send a 1000-Hz, 0-dbm test tone from the RCVR after adjusting the TONE AT TEST TONE CAL meter for a hairline indication on the TEST ALIGN meter.

(d) Terminal "B" is instructed to: (If not a relay go to step (g).)

1. Operate the TD-202/U METER SELECT switch to SERV FAC and SERV SEL switch to 0.

2. Adjust the near side TD-202/U order wire level to hairline on the TEST ALIGN meter. (Some TEST ALIGN meters have numbers. Set to 25.)

3. On near side RCVR, adjust multimeter selector switch to 1 KC OUT and set multimeter to 25 with the FDM OUTPUT LEVEL control.

4. On the far side XMTR, adjust the multimeter selector to 1 KC IN and set multimeter 25 using the INPUT LEVELS FDM control.

(e) Terminal C is instructed to adjust as in (d) above. If not a relay go to step (g).

(f) All relays in the system, in order, have to follow instructions given in (d) above.

(g) Final terminal should adjust the ORDER WIRE LEVEL control for a hairline (25) indication on the TEST ALIGN meter.

(h) Upon completion of adjustment by final terminal, the final terminal will send a tone and the sequence will be reversed and completed to terminal A.

(i) Turn off the test tones and check the order wire for proper volume.

b. *PCM Alignment Procedures (Video Level).*

(1) Place cables as shown in figure 2-10 for 12-channel or 2-11 for 24-channel operation.

(2) Set switches as shown in table 2-2. All TD-202/I's in the system must have the TEST-OPER switch to OPER.

(3) Connect cabling as shown in figure.

(4) Switch settings as shown in table 2-2.

(5) Connect CG-409H/U between TD-202/U to TO RADIO XMTR jack and PCM IN jack on T-893 (P)/GRC. For 24-channel operation, see figure 2-11.

(6) Terminal A is system controller and will inform all radio relay stations that pcm alignment is to begin.

(7) System controller will call off sequence and each operator will acknowledge as each task is completed.

(8) Terminal A will turn the METER SELECT switch of the TD-202/U to RADIO XMTR and adjust OL on panel 5A2 for a hairline indication on the TEST ALIGN meter.

(9) Terminal A will check that the XMTR INPUT LEVELS PCM control on the near side T-893 (P)/GRC is pointing straight up, multimeter selector switch turned to PCM IN and a green (midscale) reading on the multimeter.

(10) System controller instructs terminal B to: (If terminal is not a relay, go to (11) below.)

(a) Check the PCM OUT on the near side RCVR to verify the input of a pcm signal.

(b) Adjust the RL control on panel 5A3 of the near side TD-202/U for a hairline indication on the TEST ALIGN meter with the METER SELECT switch turned to FROM RADIO RCVR.

(c) Adjust the CL control on panel 5A3 on the near side TD-202/U for a maximum indication on the TEST ALIGN meter with the METER SELECT switch turned to SERV FAC and the SERV SEL switch to position C (24-channel only).

(d) Adjust the OL control on panel 5A3 on the far side TD-202/U for a hairline indication on the TEST ALIGN meter with the METER SELECT switch turned to TO RADIO XMTR.

(e) Check to see that the XMTR INPUT LEVELS PCM control on the far side T-893 (P)/GRC is pointing straight up, the Multimeter Selector switch is turned to PCM IN, and a green (midscale) reading on the multimeter.

(11) All relays will follow the above instructions in sequence to the final terminal. The system controller will instruct the final terminal to:

(a) Turn the multimeter selector switch on the R-1331(P)/GRC to PCM OUT and verify the receipt of pcm signals.

(b) Adjust the RL control on panel 5A3 of the TD-202/U for a hairline indication in the TEST

ALIGN meter with the METER SELECT switch set at FROM RADIO RCVR.

(c) Adjust the CL control on panel 5A3 of the TD-202/U for a maximum indication on the TEST ALIGN meter with the METER SELECT switch turned to SERV FAC and the SERV SEL switch to position C (24-channel only).

(12) System controller reverses the procedure and aligns from the final terminal in the line to terminal A. When alignment is completed all terminals are in frame on one (12-channel) or both (24-channels) TD-352/U's, all channels are quiet, and all TD-202/U's in the system have traffic lights out.

c. Adjusting TD-352/U Channel Gain.

(1) Remove Headset-Microphone H91A/U and the three audio cables from the AUDIO CHANNELS connectors on the front panel of the TD-352/U's.

NOTE

The audio cables and headsets are removed to ensure that any outside noise from subscribers, patch panels, or frames is not introduced on the multiplex equipment during lineup procedures. Also, unterminated multiplex channels can experience hybrid singing from Telephone Signal Converter CV-1548/G's panel 18A3B if the CV-1548/G 2 wire/4-wire switch is in the 2-wire position.

(2) Operate the TD-352/U METER SELECT switch to SERV FAC and the SERV SEL switch to OSC and adjust the OSC for a hairline indication on the TEST ALIGN meter.

(3) Establish order wire communications through the link (*a* or *b* above).

(4) At both terminals, operate the TD-352/U SERV SEL switch to CHAN 1-12 (straight up).

NOTE

The procedures given in (5) through (9) below must be performed simultaneously at both terminals. This is necessary because the signal used for the adjustment at one end of the link is generated at the other end of the link.

(5) Operate the TD-352/U 2 WIRE-4 WIRE switch at both terminals to the position corresponding to the type of line or trunk (two- or four-wire) connected to channel 1.

(6) Operate the TD-352/U CHAN 1-12 switch at both ends of the link to 1.

(7) Adjust the TD-352/U AG control for channel 1 at both ends of the link for a center hairline indication on the TEST ALIGN meter.

(8) Perform the procedures given in (4), (5), and (6) above for each channel of the TD-352/U's. It is faster to do all odd-numbered channels in turn and then all even-numbered channels.

(9) Operate the TD-352/U CHAN 1-12 switch at both ends of the link to OFF and the SERV SEL switch to +25.

(10) Repeat (2) through (9) above for the SLAVE TD-352/U (24-channel operation only).

NOTE

Always maintain communications between terminals by use of the TD-204/U order wire facilities to this point. Do not use the order wire facilities for idle conversation.

(11) Reinstall the Handset-Microphone H-91A/U's on the front panel of the TD-352/U's.

(12) Meet the distant terminal on channel 1 and talk across channel. Note the quality of channel communication.

(13) Talk to the distant terminal across each channel in turn and note the quality of each. Communication on each channel must be free of noise and clear in both directions.

d. Secure Equipment (TSEC/KG-27) Lineup. Before the secure equipment is placed in the system, a reliable nonsecure system (chapter 2, sections IV and V) must be available for use with secure equipment installed. The procedure below assumes that the TSEC/KG-27 has been previously installed in the assemblage in accordance with installation instructions provided in paragraph 2-11. If not, these installation instructions must be accomplished before proceeding to the secure lineup procedures.

NOTE

The TSEC/KG-27 installation kit cables used for secure operation differ from those used during nonsecure operation. It is imperative that the proper cables be used during secure operation to avoid the possibility of TEMPEST radiation.

(1) Perform the equipment checks and adjustments as outlined in paragraph 2-14p.

(2) Make cable connections in accordance with the figure specified in table 2-1 for the system configuration desired.

NOTE

Perform *c*(3) through (7) above at both terminals.

(3) Install Adapter Connector UG-1923/G (fig. 2-6) to the TO AUX receptacle on the front panel of the TD-352/U(s).

(4) Ensure that the AUX IN/OUT switch is in the IN position.

(5) Operate the TSEC/KG-27 MONITOR switch to each of the voltage check positions and observe that the MONITOR lamp lights in each position.

(6) Operate the TSEC/KG-27 MONITOR switch to each of the XMIT positions and observe that the MONITOR lamp lights in each position.

(7) Operate the TSEC/KG-27 MONITOR switch to each of the REC positions and observe that the MONITOR lamp lights in each of the positions.

NOTE

Both terminals in the system must have their multiplex equipment activated or the

MONITOR lamp will not light. The TSEC/KG-27 will not synchronize with the distant terminal until the multiplexers have achieved synchronization (frame condition).

(8) If the TSEC/KG-27 goes into the alarm condition, set the ON-OFF/RESET switch to OFF/RESET, pause, and return to the ON position to initiate a restart. If the alarm condition persists refer to the system troubleshooting in chapter 5.

(9) For additional information pertaining to TSEC/KG-27 normal starting procedures refer to KAM 258()/TSEC.

WARNING

To prevent TEMPEST hazard, disconnect the phone-intercom cable from the signal entrance box if in use. Also, remove the headset(s) from the TALK-MONITOR receptacles when not in use.

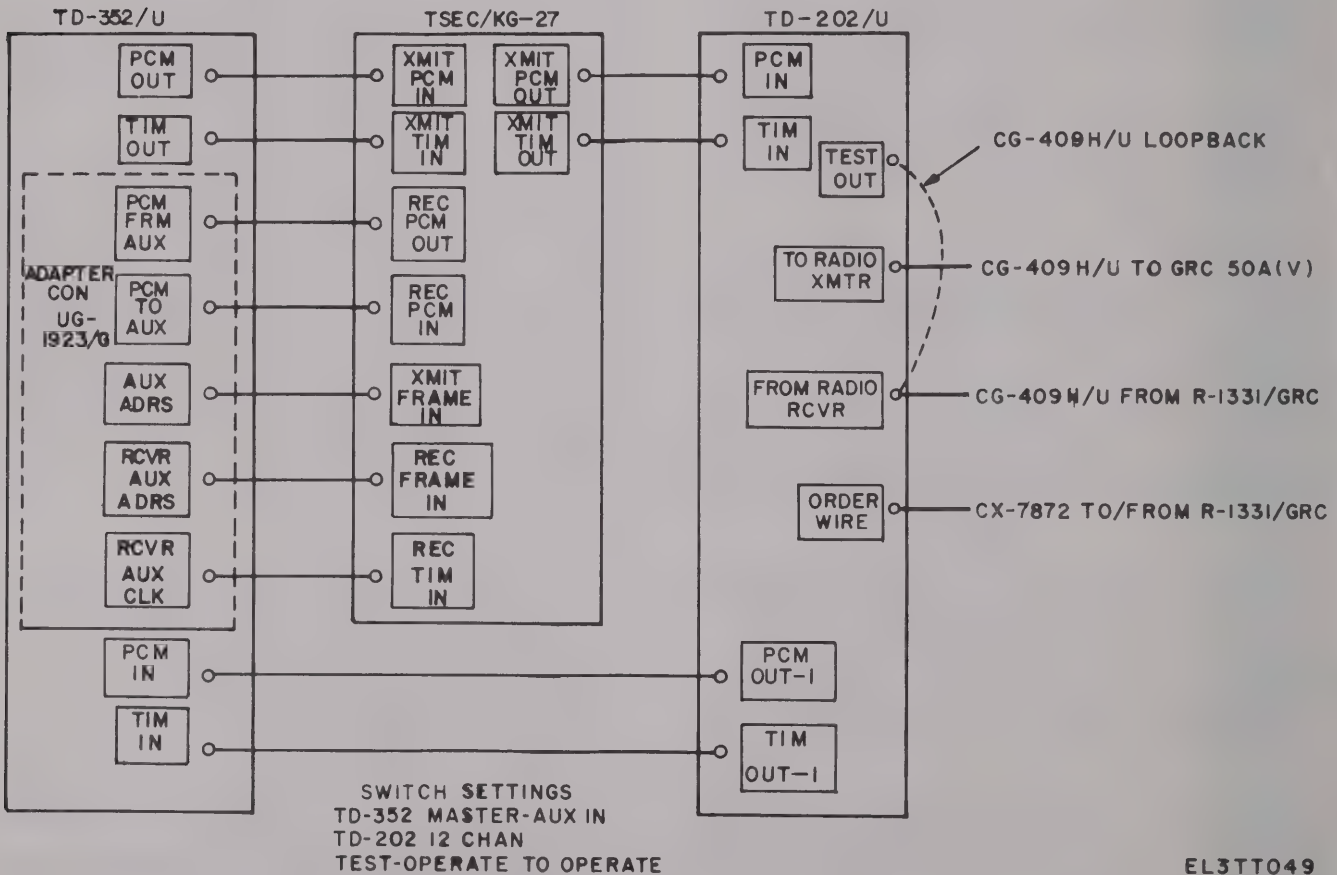


Figure 2-57. Secure 12-channel radio terminal interunit connection diagram.

EL3TT049

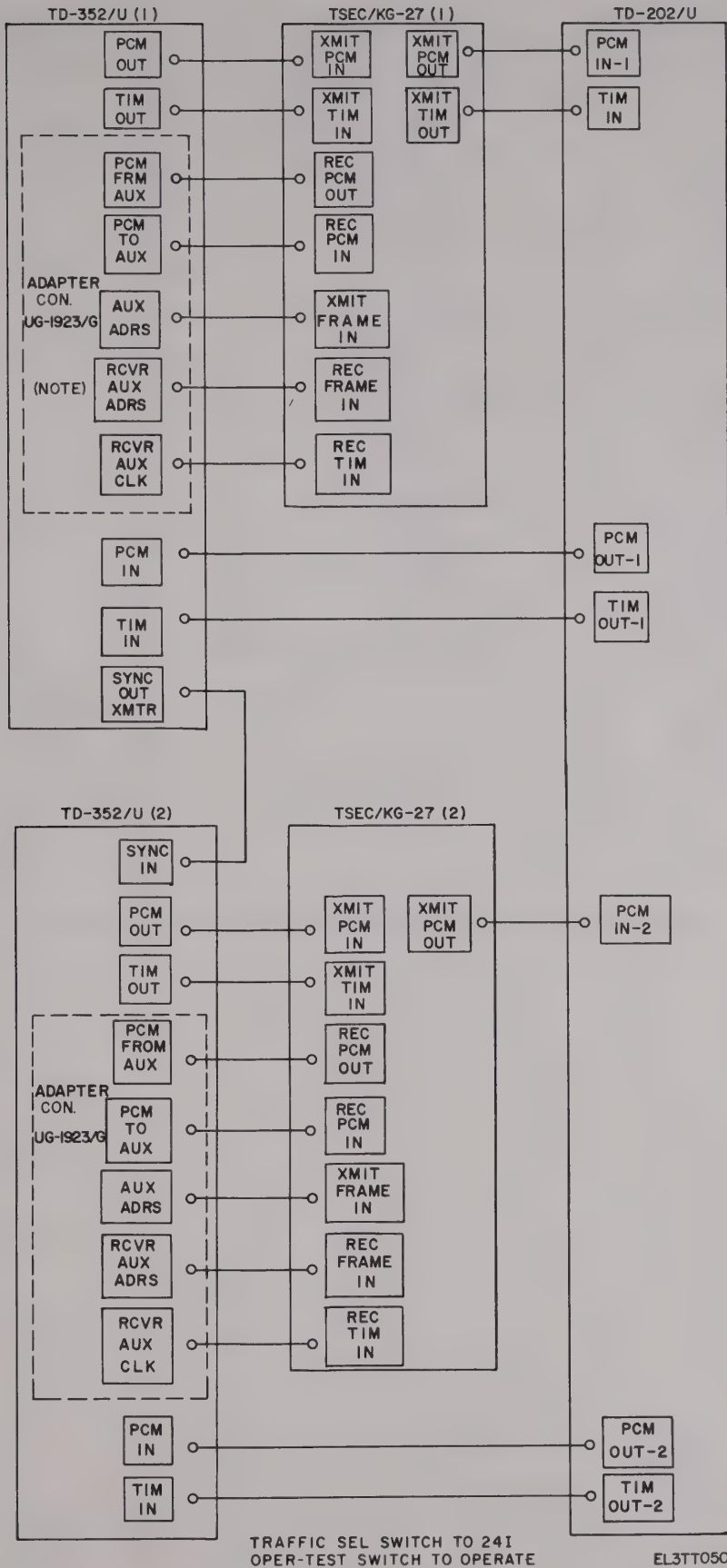
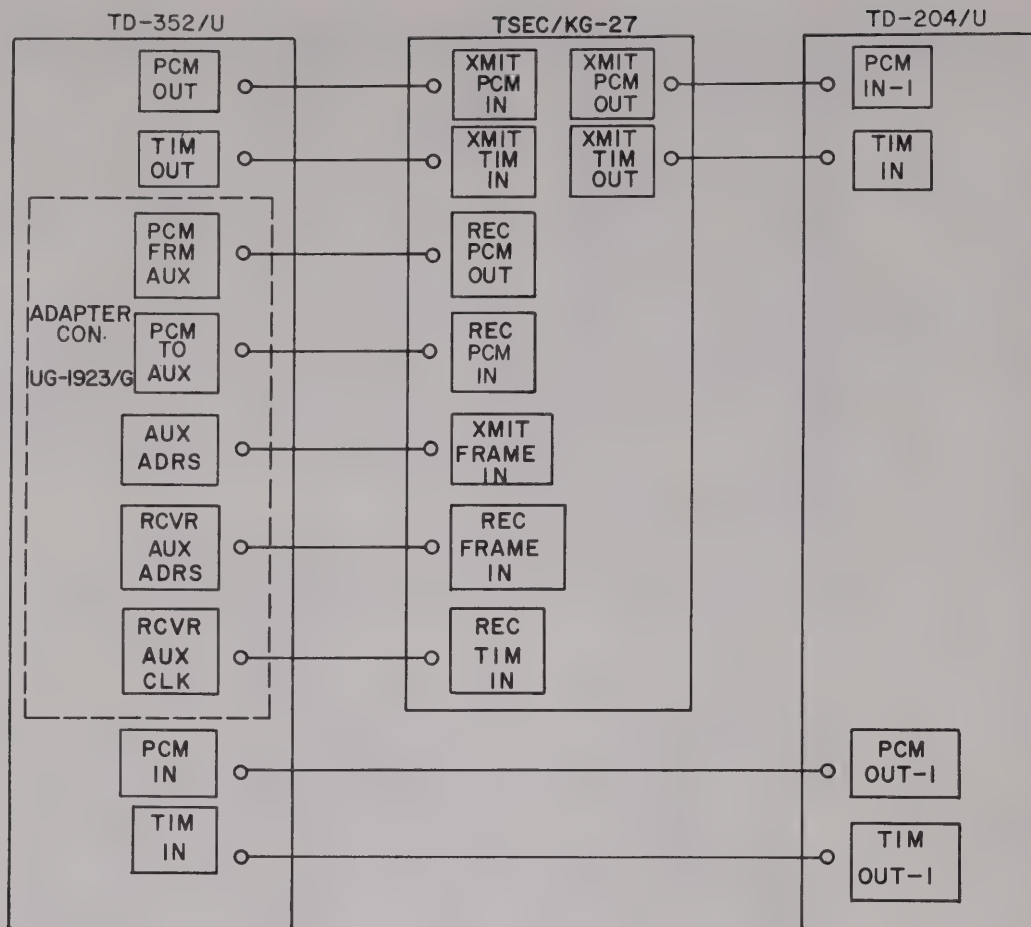
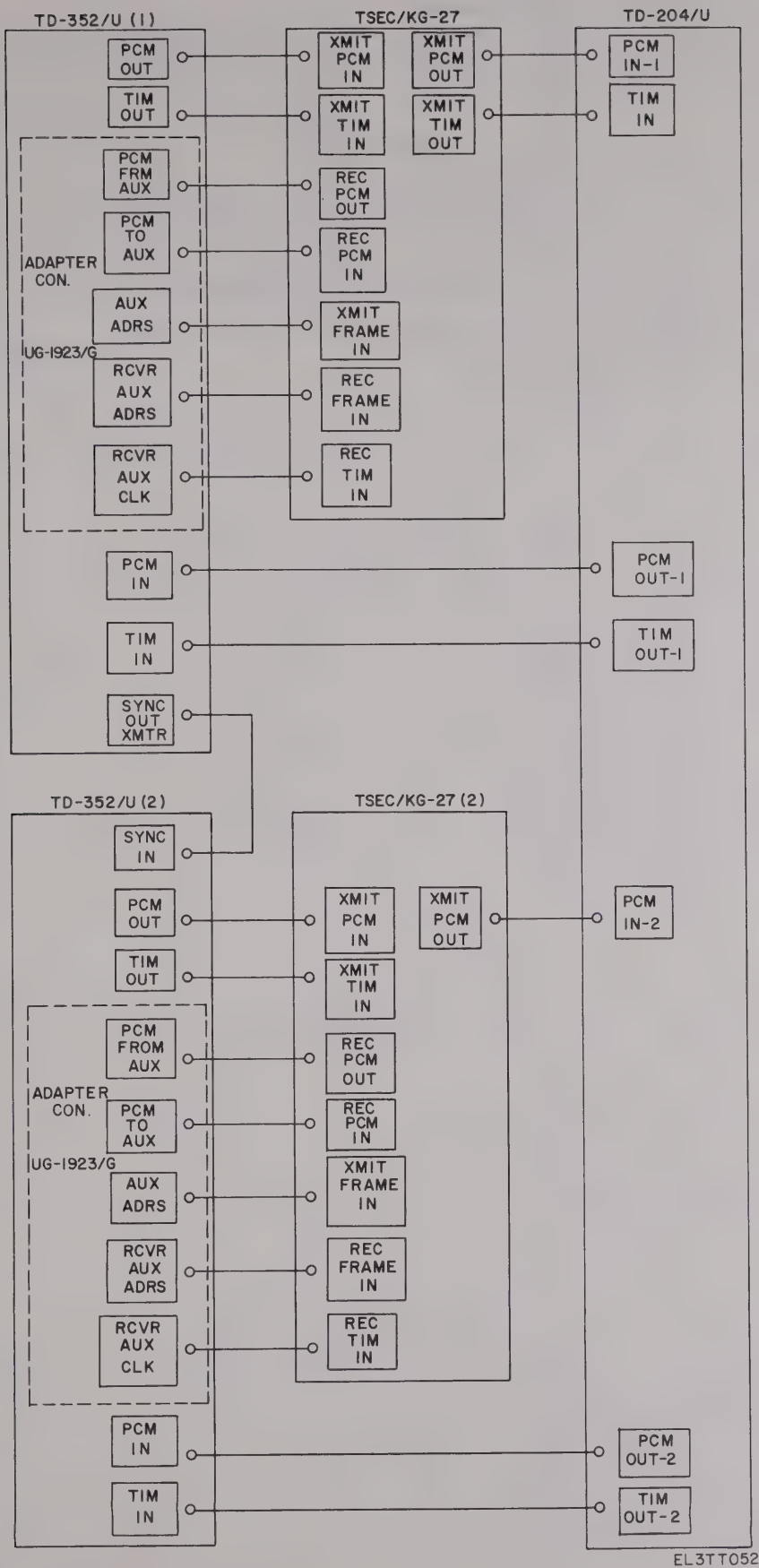


Figure 2-58. Secure 24-channel radio terminal interunit connection diagram.



EL3TT05I

Figure 2-59. Secure 12-channel cable terminal interunit connection diagram.



EL3TT052

Figure 2-60. Secure 24-channel cable terminal interunit connection diagram.

2-18. Radio Set AN/VRC-46 Installation

a. Units equipped with the AN/TRC-117 whose TOE's authorize installation of Radio Set AN/VRC-46 in vehicles are also authorized use of this radio installed in the AN/TRC-117.

b. The installation kit contains all required parts, components, hardware, drawings, photographs, and step-by-step instructions. Kits will be requisitioned directly by those using units, where applicable, using NSN 5820-00-156-4522, Hardware Kit, Electronic Equipment, for AN/TRC-117.

c. Installations are to be effected at general support

level.

d. Before the AN/TRC-117 is returned to the supply system, remove the AN/VRC-46 radio set components and the easily detachable installation components. Dispose of in accordance with existing regulations.

e. The 'permanently; installed installation components are to remain with the AN/TRC-117 being returned to the supply system. These items will remain with the AN/TRC-117 for the balance of the useful life. This also includes shelters rehabilitated by depot maintenance activities.

CHAPTER 3

OPERATING INSTRUCTIONS

Section I. OPERATION UNDER USUAL CONDITIONS

3-1. Operator/Crew Controls

NOTE

Except for the controls and indicators listed in tables 3-1, 3-2 and 3-3 below, all

controls and indicators for the AN/TRC-117(*) are covered in the appropriate technical manual (appx A).

Table 3-1. POWER DISTRIBUTION PANEL Controls (fig. 2-45)

| Control or indicator | Description | Function |
|--|---------------------|---|
| MAIN circuit breaker | 70 amperes | Provides overload protection and control of tributary circuit breakers. |
| Circuit breakers (tributary): LIGHTS | 15 amperes | Ceiling lights (fluorescent and incandescent). |
| BLOWERS | 15 amperes | Exhaust blowers. |
| HEATER 1 | 20 amperes | HEATER 1 receptacle. |
| CONV & INTERCOM | 15 amperes | CONVENIENCE and INTERCOM receptacles. |
| HEATER 2 | 20 amperes | HEATER 2 receptacle. |
| VOLT REG | 40 amperes | Unregulated input to CN-514/GRC. |
| VOLTS A.C. meter | 0-150 Vac. | Indicates input voltage to assemblage. |
| A.C. AMPERES | 0-100 amperes. | Indicates total current drain in assemblage. |
| Indicators No. 1 through 6 | NE-45 | Glow when associated circuit breaker is operated to ON. |

Table 3-2. Overvoltage Protection Device (fig. 2-46)

| Control or indicator | Description | Function |
|-----------------------|---------------------------------|--|
| POWER switch. | Momentary three-position switch | ON position; momentary position resets power relay to apply power to rack equipment circuit breakers. OFF position; momentary position disengages power relay to remove power from rack equipment circuit breakers. |
| Power indicator | Neon lamp | Lights when power relay is operated and power is available at output receptacle. |

Table 3-3. Miscellaneous Controls and Indicators (fig. FO-1)

| Control or indicator | Description | Function |
|---|---------------------|---|
| POWER INDICATOR | R2A neon lamp | Glows when ac power is applied to POWER & SIGNAL ENTRANCE BOX. |
| Blackout switch | Microswitch | Extinguishes assemblage lights when entrance door is open and BYPASS BLACKOUT switch is at BLACKOUT. |
| BYPASS BLACKOUT | Two-position | Controls assemblage lights as follows: BYPASS position—permits assemblage light circuits to be connected by individual switches. |
| FLUORESCENT LIGHTS switch | Two-position | Controls fluorescent ceiling lights. |
| INCANDESCENT COLD START LIGHTS switch | Two-position | Controls incandescent ceiling lights. |

Table 3-3. Miscellaneous Controls and Indicators (Fig. FO-1)—Continued

| Control or indicator | Description | Function |
|---|--------------------------------|--|
| BLOWER 1 switch | Two-position | Controls roadside blower. |
| BLOWER 2 switch | Two-position | Controls curbside blower. |
| SYSTEM 1 and SYSTEM 2 circuit breakers (roadside rack) | Two-position | Control regulated power to roadside rack equipment. |
| SYSTEM 1 and SYSTEM 2 circuit breakers (front rack) | Two-position | Control regulated power to front rack equipment. |
| CONV BREAKER (in POWER & SIGNAL ENTRANCE BOX). BINDING POSTS-CABLE switches (interior of SIGNAL ENTRANCE BOX) | 24 two-position switches | Select input lines from associated 26-pair connector or from individual binding posts. |

3-2. Energizing Ac Circuits

Energize the ac circuits in the assemblage and turn on the lights following the procedures in paragraph 2-14a(2). Check to see that all assemblage lights operate properly.

3-3. Operating Heaters, Blowers, LS-147C/F1, and TA-312/PT

a. Exhaust Blowers.

(1) Open the blower vents on the outside of the assemblage front wall.

(2) Open the air filter cover on the outside of the entrance door.

(3) Operate the POWER DISTRIBUTION PANEL BLOWERS circuit breaker to ON; the associated neon indicator will light.

(4) Operate the BLOWER 1 and BLOWER 2 switches on the ceiling power ducts (B, fig. FO-1) to ON; the blowers should operate.

b. Heaters.

(1) Remove the heater from the HEATER 1 storage rack and place it on the floor near the HEATER 1 receptacle.

(2) Insert the heater power connector into the HEATER 1 receptacle.

(3) Operate the POWER DISTRIBUTION PANEL HEATER 1 circuit breaker to ON; the associated neon indicator will light.

(4) Operate the heater switch to ON and adjust the TEMPERATURE control for the desired temperature.

CAUTION

Do not operate both heaters while the rack equipment is operating. Operation of both heaters and the rack equipment at the same time will overload the POWER DISTRIBUTION PANEL MAIN circuit breaker.

(5) If the second heater is required, remove it from the HEATER 2 storage rack and place it on the floor near the HEATER 2 receptacle. Insert the heater power connector into the HEATER 2 recep-

tacle and operate the POWER DISTRIBUTION PANEL HEATER 2 circuit breaker to ON.

(6) Operate the heater switch to ON and adjust the TEMPERATURE control for the desired temperature.

c. *Intercommunications Stations LS-147C/F1* (C, fig. FO-1).

(1) Insert the LS-147C/F1 power cord connector into the INTERCOM receptacle in the power duct.

(2) Operate the LS-147C/F1 OFF-SEND switch to 5 (about midpoint); the glowlamp will light.

(3) Operate the PRESS-TO-TALK switch and speak into the front panel speaker-microphone. Release the PRESS-TO-TALK switch to listen.

NOTE

The OFF-SEND switch does not have to be turned on to receive a call.

(4) Adjust the RECEIVE control to regulate the volume of incoming calls.

d. *Telephone Set TA-312/PT*.

(1) *Initiating call.* Lift the handset from the cradle and turn the handcrank. Press the press-to-talk switch to talk, and release it to receive. Replace the handset in the cradle after the call is completed.

(2) *Answering call.* When the TA-312/PT rings, lift the handset from the cradle and listen to the receiver. Press the press-to-talk switch to talk to the calling party. Replace the handset in the cradle after the call is completed.

3-4. Operating AN/GRC-50A(V)

CAUTION

In all starting procedures, the receiver components must be tuned before the transmitted components. The receive and transmit frequencies must be separated by at least 15 channels. Preset the tuning controls to their approximate assignments before applying power to the equipment.

a. *Initial Control Settings.* Operate all controls on the PP-2054/GRC, R-1331(P)/GRC (including AM-1955A/GRC or AM-1956A/GRC), and T-893(P)/GRC (including AM-1957/GRC or AM-158A/GRC) as indicated in table 3-4.

b. *Voltage Regulator CN-514/GRC.*

(1) Check to see that the SYSTEM 1 and SYSTEM 2 circuit breakers on the equipment racks are operated to OFF.

(2) Operate the CN-514/GRC POWER switch to ON. The POWER ON indicator will light.

(3) Operate the MANUAL-AUTOMATIC switch to MANUAL. The MANUAL indicator will light.

(4) Check the indication on the REGULATED OUTPUT VOLTAGE meter and operate the RAISE-LOWER switch to adjust the meter indication to 115 volts.

(5) Operate the MANUAL-AUTOMATIC switch to AUTOMATIC. Check to see that the MANUAL indicator extinguishes and that the meter indicates 115 volts.

(6) Operate the overvoltage protection device power switch (momentarily) to ON and release it. The indicator will light.

(7) Operate the SYSTEM 1 and SYSTEM 2 circuit breakers to ON.

NOTE

Before tuning the R-1331(P)/GRC and/or transmitter, remove the video coaxial cable from the receiver transmitter. Remove the order wire extraction cable from the R-1331(P)/GRC.

c. *Receiver, Radio R-1331(P)/GRC.*

(1) Connect the antenna cable to the TO ANT receptacle on the AM-1957/GRC or AM-1958A/GRC in the T-893(P)/GRC.

(2) Operate the R-1331(P)/GRC AC POWER switch to ON. The AC POWER indicator will light, the INCOMING CALL indicator will light, and the buzzer will sound.

NOTE

After a few seconds, the INCOMING CALL indicator will extinguish and the buzzer will silence. Wait 5 minutes before continuing with the tuning procedures.

(3) Adjust the AM-1955A/GRC or AM-1956A/GRC OSCILLATOR control for a maximum indication on the R-1331(P)/GRC multimeter.

(4) Operate the R-1331(P)/GRC multimeter selector switch to REC SIGNAL. If a signal is being

Table 3-4. Initial Control Settings

| Component | Control | Position/action |
|------------------------------------|---|---|
| PP-2054/GRC | AC POWER..... OPERATE-STAND BY | OFF STAND BY |
| T-893(P)/GRC..... | AFC CORRECTION..... INPUT LEVELS PCM | Midrange Midrange |
| | INPUT LEVELS FDM | Midrange |
| | AFC selector | TUNE |
| | AFC TUNE | Operate for desired channel on AFC TUNE CHANNEL indicator. |
| AM-1957/GRC or AM-1958A/GRC | POWER OUT | Operate for desired channel on TRANSMIT CHANNEL indicator. |
| | MAIN TUNING | Operate to desired channel on dial indicator. |
| | COUPLING | Operate to desired channel on dial. |
| | REC SIG-2..... | Operate to desired channel on RECEIVE CHANNEL indicator. |
| | WAVEMETER..... | Operate to reading listed under MAIN TUNE column on WAVEMETER CHART corresponding to desired channel. |
| R-1331(P)/GRC..... | AC POWER..... | OFF |
| | Multimeter selector..... | OSC |
| | TEST TONE | OFF |
| | FDM OUTPUT LEVEL | Midrange |
| | SQUELCH INCR SENS | Maximum clockwise |
| AM-1955A/GRC or AM-1956A/GRC | REC SIG-1..... | Operate to desired receive channel (indicated on respective dial). |
| | OSCILLATOR..... | Operate to desired receive channel (indicated on respective dial). |
| | WAVEMETER..... | Operate to control reading on WAVEMETER CHART corresponding to assigned channel. |

received, adjust REC SIG-1 control for a peak indication on the multimeter.

(5) Hold the R-1331(P)/GRC AFC DISABLE switch pressed and adjust the OSCILLATOR control for a peak indication on the multimeter.

NOTE

Do not turn on the T-893(P)/GRC to perform the procedures given in (6) below.

(6) Adjust the AM-1957/GRC or AM-1958A/GRC REC SIG-2 control (in the T-893(P)/GRC) for a peak indication on the receiver multimeter.

(7) Operate the R-1331(P)/GRC multimeter selector switch to the OSC position. Adjust the AM-1955A/GRC or AM-1956A/GRC WAVEMETER control for a peak indication on the multimeter. The wavemeter dial reading should indicate within two divisions of the reading obtained from the WAVE-METER CHART for the receive channel. If the reading is greater than two divisions, notify the transmitting station to return its transmitter to the correct frequency.

(8) Turn meter select switch to REC SIGNAL.

(9) Retune REC-SIG-1 to read 10 on the multimeter.

(10) Retune REC-SIG-1 for a maximum indication on the multimeter.

d. Transmitter, Radio T-893(P)/GRC with AM-1957/GRC.

(1) Disconnect the antenna cable from the TO ANT receptacle and connect a CG-718B/U between the TO ANT receptacle and one of the Dummy Loads, Electrical DA-189/GRC on top of the equipment rack.

(2) Operate the PP-2054/GRC AC POWER switch to ON and the OPERATE-STANDBY switch to OPERATE. After about 75 seconds, the FIL, LV, and HV indicators will light. Wait about 15 minutes before proceeding with the tuning procedure.

NOTE

The buzzer will sound several times during these procedures. Silence it each time with the BUZ OFF switch.

(3) Operate the T-893(P)/GRC multimeter selector switch to MAIN TUNE.

(4) Adjust the AM-1957/GRC MAIN TUNING control for a peak indication on the multimeter. Lock the MAIN TUNING control.

NOTE

If the meter indication goes off-scale during the tuning procedure, depress the T-893(P)/GRC METER SHUNT switch.

(5) Operate the multimeter selector switch to MIXER and adjust the AM-1957/GRC MIXER control for a peak indication on the multimeter. Now repeat (4) and (5) above. Lock the MIXER control.

(6) Operate the AM-1957/GRC WAVEMETER dial to the OUT FREQ indication listed in the WAVEMETER CHART for the desired frequency.

(7) Operate the multimeter selector switch to AMP and adjust the AM-1957A/GRC AMP control for a peak indication on the multimeter.

NOTE

If the LOW POWER indicator lights and the buzzer sounds, silence the buzzer with the BUZ OFF switch.

(8) Operate the multimeter selector switch to OUT FREQ and adjust the T-893(P)/GRC AFC CORRECTION control for a peak indication on the multimeter.

(9) Check to see that the indication on the AFC meter is within ± 10 divisions of midscale. If it is not, repeat the procedure given in (3) above, re-center the AFC CORRECTION control and repeat the procedures given in (7) and (8) above.

(10) Operate the T-893(P)/GRC multimeter selector switch to PWR OUT and adjust the AM-1957/GRC POWER OUT control for a peak indication on the multimeter. The POWER OUT indicator should indicate near the desired channel.

(11) Adjust the AM-1957/GRC COUPLING control for a peak indication on the multimeter, and then repeak the multimeter with the AMP, POWER OUT, and COUPLING controls.

NOTE

If no output is indicated on the multimeter, detune the COUPLING control and repeat the tuning procedure. The LOW POWER indicator should be extinguished.

(12) Operate the multimeter selector switch to REF PWR and note the reading on the multimeter.

(13) Operate the multimeter selector switch to PWR OUT. The indication on the multimeter should be several times greater than that noted in (12) above.

(14) Operate the multimeter selector switch to AFC LEV. Adjust the AFC LEVEL control for peak indication on the multimeter.

(15) Adjust the AFC TUNE control for a peak indication on the multimeter, and then repeak the AFC LEVEL and AFC TUNE controls.

(16) Operate the T-893(P)/GRC AFC selector switch to ODD if the desired channel number is odd, or to EVEN if the channel is even.

(17) Check the automatic frequency control (afc) circuit for lockon by rotating the AFC COR-

RECTION control in either direction until the AFC meter indicates ± 40 . The meter should return to center. Return the AFC CORRECTION control to its original setting. The meter indication should again return to center and stop.

(18) Operate the multimeter selector switch to OUT FREQ.

(19) Adjust the WAVEMETER control for a maximum indication on the multimeter. The WAVEMETER dial should indicate within two divisions of the OUT FREQ reading in the WAVE-METER CHART. If the difference is greater than two divisions, repeat the entire tuning procedure.

(20) Check the indication on the DA-189/GRC meter. The meter should indicate between 15 and 30 watts.

(21) Operate the PP-2054/GRC OPERATE-STAND BY switch to STAND BY. Disconnect the CG-718B/U from the AM-1957/GRC TO ANT receptacle and connect the antenna cable from the shelter entrance. Operate the PP-2054/GRC OPERATE-STAND BY switch to OPERATE.

e. Transmitter, Radio T-893(P)/GRC with AM-1958A/GRC.

(1) Disconnect the antenna cable from the AM-1958A/GRC TO ANT receptacle and connect a CG-718B/U between the TO ANT receptacle and one of the DA-189/GRC's on top of the equipment rack.

(2) Operate the PP-2054/GRC AC POWER switch to ON and the OPERATE-STAND BY switch to OPERATE. After about 75 seconds, the FIL, IV and HV indicators will light. Wait about 15 minutes before proceeding with the timing procedure.

(3) Operate the T-893(P)/GRC multimeter selector switch to OSC and adjust the AM-1958A/GRC OSC control for a peak indication on the multimeter.

(4) Operate the T-893(P)/GRC multimeter selector switch to MAIN TUNE and adjust the AM-1958A/GRC MAIN TUNING control for a peak indication on the multimeter. Lock the MAIN TUNING control.

NOTE

If the meter indication goes off-scale during the tuning procedure, press the T-893(P)/GRC METER SHUNT switch.

(5) Operate the multimeter selector switch to MIXER and adjust the AM-1958A/GRC MIXER control for a peak indication on the multimeter. Repeat (3), (4), and (5) above. Lock the MIXER control.

(6) Operate the AM-1958A/GRC WAVE-METER dial to the OUT FREQ indication listed in

the WAVEMETER CHART for the desired frequency.

(7) Operate the multimeter selector switch to AMP and adjust the AM-1958A/GRC AMP control for a peak indication on the meter.

NOTE

The indication obtained may be very low until the power out adjustment is made. If the LOW POWER indicator lights and the buzzer sounds, silence the buzzer with the BUZ OFF switch.

(8) With the multimeter selector switch still in the AMP position, adjust the T-893(P)/GRC AFC CORRECTION control for a peak indication on the multimeter.

(9) Check to see that the indication on the AFC meter is within ± 10 divisions of midscale. If it is not, repeat the procedure given in (4) above, recenter the AFC CORRECTION control, and then repeat the procedures given in (7) and (8) above.

(10) Operate the multimeter selector switch to PWR OUT and adjust the AM-1958A/GRC POWER OUT control for a peak indication on the multimeter. The POWER OUT indicator dial should indicate near the desired channel.

(11) Repeat steps (7) through (10).

(12) Adjust the AM-1958A/GRC COUPLING control for a peak indication on the multimeter, and then repeak the POWER OUT control. Check to see that the T-893(P)/GRC LOW POWER indicator is extinguished.

(13) Operate the multimeter selector switch to REF PWR and note the indication on the meter.

(14) Operate the multimeter selector switch to PWR OUT. The indication on the multimeter should be at least 10 times greater than that noted in (13) above.

CAUTION

If multimeter indication is not 10 times greater, turn off transmitter and troubleshoot the radio.

(15) Operate the multimeter selector switch to AFC LEV. Adjust the AFC LEVEL control for a peak indication on the multimeter. When several peaks are noted, use the first highest peak.

(16) Adjust the T-893(P)/GRC AFC TUNE control for a peak indication on the multimeter, and then repeak the AFC LEVEL and AFC TUNE controls for the test indication on the multimeter. The AFC TUNE dial should remain very close to the desired channel.

(17) Turn on the 1KC tone of the R-1331(P)/GRC and adjust to 25 at TEST TONE CAL. With the XMTR multimeter selector switch set to 1 KC

MOD the multimeter should be in the green. If not in the green, adjust the AFC LEVEL CONTROL, to obtain it.

(18) Operate the T-893(P)/GRC AFC selector switch to ODD if the desired channel number is odd, and to EVEN if the channel number is even.

(19) Rotate the AFC CORRECTION control in either direction until the AFC meter indicates ± 40 . Release the control; the meter indication should return to center. Return the AFC CORRECTION control to its original setting. The meter indication should again return to center and stop.

(20) Operate the multimeter selector switch to OUT FREQ.

(21) Adjust the WAVEMETER control for a peak indication on the multimeter. Check the WAVEMETER dial indication; it should be within ± 2 divisions of the reading listed in the OUT FREQ column of the WAVEMETER CHART for the desired frequency. If the reading is greater than two divisions, repeat the entire tuning procedure.

(22) Check the indication on the DA-189/GRC dummy load meter; the meter should indicate 12 watts or more. If it is less than 12 watts, refer to chapter 4 for corrective action.

(23) Operate the multimeter selector switch to PWR OUT and adjust the POWER OUT control for a peak indication on the multimeter.

(24) Adjust POWER OUT control to reduce the indication on the DA-189/GRC meter to 8 watts for the AM-1958A/GRC, or 11 watts for the AM-1957/GRC.

(25) Turn ALARMS ADJ (screwdriver) control until the LOW POWER lamp lights and the buzzer sounds.

(26) Readjust POWER OUT control for a maximum reading on the DA-189/GRC meter.

(27) Operate the PP-2054/GRC OPERATE-STANDBY switch to STANDBY. Disconnect the CG-7188B/U from the AM-1958A/GRC TO ANT receptacle and reconnect the antenna cable to the TO ANT receptacle. Operate the PP-2054/GRC OPERATE-STANDBY switch to OPERATE.

3-5. Operating Rack Equipment

a. Multiplexer TD-202/U.

(1) Check to see that the TD-202/U is connected properly (para 2-10).

(2) Operate the TD-202/U AC POWER switch to ON. Check to see that the AC POWER indicator lights.

(3) Operate the meter selector switch to SERVE FAC and check and adjust if need the regulated voltages using the SERV SEL switch.

b. Multiplexer TD-204/U.

(1) Check to see that the TD-204/U is properly

connected (para 2-10) to fit the circuit requirements of the communications system in use.

(2) Operate the AC POWER switch to ON. The AC POWER and ALARMS NO CABLE CURRENT indicators will light.

NOTE

DO NOT operate the CABLE POWER switch to ON if Pulse Form Restorer TD-206/G is not being used in the communications system in use. 1,000 volts can be present in the transmission cable.

(3) Operate the TD-204/U CABLE POWER switch to ON. The ALARMS NO CABLE CURRENT indicator will extinguish and the buzzer will sound. Silence the buzzer with the ALARMS BUZZER OFF switch.

(4) Operate the meter selector switch to SERV FAC and check the regulated voltages using the SERV SEL switch.

c. Multiplexer TD-352/U.

(1) Check to see that the TD-352/U connections are properly made to fit the circuit requirements of the communications system (para 2-10).

(2) Operate the AC POWER switch to ON; the AC POWER indicator will light.

(3) Operate the meter selector switch to SERV FAC and check the regulated voltages using the SERV SEL switch.

d. Telephone Signal Converter CV-1548/G.

(1) Check to see that the CV-1548/G is properly connected (fig. FO-4).

(2) Operate the AC POWER switch to ON; the AC POWER indicator will light.

3-6. TSEC/KG-27 Operation

a. *Preoperational Procedure.* Upon completion of the installation of the TSEC/KG-27 equipment in the shelter (para 2-11) all preoperational procedures will be performed in accordance with the procedures provided in the equipment KAM (appx A).

b. Operation.

(1) Assure that the permuters are set to the prescribed settings, that the permuter trays are properly inserted in their respective housings and that the permuter doors are closed and securely fastened. It is assumed that the transmission equipment (radio or cable) have been turned on and are operational.

NOTE

The permuter must be reprogrammed if the permuter access door, once having been closed, is opened. Opening the door of a cocked permuter causes the zeroize feature to clear any program entered on the permuter tray.

(2) Turn on the TD-352/U and wait several seconds, until the TD-352/U frames. (FRAME ALARM lamp goes out.)

(3) Turn on the TSEC/KG-27. The ALARM lamp should be out and the system should now be in operation.

(4) For additional information pertaining to the TSEC/KG-27 operation, refer to KOA-133()/TSEC.

3-7. Order Wire Communication (Nonsecure)

Order wire communication facilities are available in the TD-204/U and the AN/GRC-50. Use the procedures in *a*, *b*, or *c* below as applicable. If TD-204/U and the AN/GRC-50 are used at the installation (as a cable-to-radio conversion installation), use the procedures in *a* or *b* below for communication over the cable link and in *c* below over the radio link.

a. TD-204/U.

(1) *Initiating a call.*

(a) Operate the TD-204/U TALK-OFF-SIG switch to TALK.

(b) Listed to the H-91A/U receiver to determine whether the order wire circuit is in use.

(c) If the circuit is not in use, operate the TALK-OFF-SIG switch to SIG for about 2 seconds.

NOTE

If identification codes are assigned to the terminal or repeater being called, operate the TALK-OFF-SIG switch between OFF and SIG corresponding to the identification code.

(d) Operate the TALK-OFF-SIG switch to TALK to talk with the distant station.

(e) When the called is completed, operate the TALK-OFF-SIG switch to OFF, and replace the H-91A/U in its mounting bracket.

(2) *Answering a call.*

(a) When the TD-204/U CALL indicator lights and the buzzer sounds, operate the TALK-OFF-SIG switch to TALK, and answer the call.

NOTE

If identification codes have been assigned, answer only those calls corresponding to your assigned identification code.

(b) When a call is completed, operate the TALK-OFF-SIG switch to OFF and replace the H-91A/U in its mounting bracket.

b. AN/GRC-50.

(1) *Initiating a call.*

(a) Lift Handset H-156/U from its mounting bracket.

(b) Press the R-1331(P)/GRC RING switch for about 2 seconds.

NOTE

If identification codes are assigned, press the RING switch in accordance with the identification code assigned to the terminal or repeater being called.

(c) Wait for an answer.

(d) Press the H-156/U PRESS-TO-TALK switch and talk into the handset. Release the PRESS-TO-TALK switch to listen.

(e) When the call is completed, replace the H-156/U in its mounting bracket.

(2) *Answering a call.*

NOTE

If identification codes are assigned, answer only when the call corresponds to the assigned identification code.

(a) When the INCOMING CALL indicator lights, and the buzzer sounds, lift the H-156/U from its mounting bracket.

(b) Press the H-156/U PRESS-TO-TALK switch and answer the call.

(c) When the call is completed, replace the H-156/U in its mounting bracket.

3-8. Order Wire Communications (Secure)

Perform secure communications in accordance with procedures provided in TSEC/KG-27 KAM (appx A).

3-9. Monitoring Channels

WARNING

To prevent a TEMPEST hazard, remove headset plug from jack when not in use.

a. Connect Headset-Microphone H-91A/U to the TALK-MONITOR receptacle on the TD-352/U front panel.

CAUTION

When the system is in operation, never operate the TD-352/U CHAN switch from OFF if the SERV SEL switch is at CHAN 1-12 (vertical up). If the SERV SEL switch is at CHAN 1-12 and the CHAN switch is operated to a channel, a 1,000 Hz tone is sent out over the channel.

b. Operate the CHAN switch to the desired channel and listen to the H-91A/U receiver. Speak into the H-91A/U microphone to talk on the monitored channel.

c. The channel being monitored may be switched by operating the CHAN switch as required.

d. After monitoring is complete, operate the CHAN switch to OFF and the SERV SEL switch to ± 25 . Disconnect the H-91A/U from the TALK-MONITOR receptacle.

3-10. Stopping Procedures

a. *AN/GRC-50A(V)*. If the AN/GRC-50A(V) components are to be turned off for less than 2 hours, leave the R-1331(P)/GRC on and place the T-893(P)/GRC in standby by operating the PP-2054/GRC OPERATE-STANDBY switch to STANDBY. If the equipment is to be turned off for a longer period, proceed as follows:

(1) Operate the R-1331(P)GRC AC POWER switch to OFF.

(2) Operate the PP-2054/GRC OPERATE-STANDBY switch to STANDBY.

(3) Operate the PP-2054/GRC AC POWER switch to OFF.

(4) Operate the T-893(P)/GRC AFC selector switch to TUNE.

b. *TD-202/U, TD-204/U, TD-352/U, CV-1548/G, TSEC/KG-27*.

(1) Operate the TD-204/U CABLE POWER switch to OFF. Observe that the ALARMS NO CABLE CURRENT indicator lights and the buzzer sounds.

(2) Operate the TD-202/U, TD-204/U, TD-352/U, CV-1548/G, TSEC/KG-27 ac power switches to OFF.

c. *Voltage Regulator CN-514/GRC*. Operate the CN-514/GRC POWER switch to OFF.

Section II. OPERATION UNDER UNUSUAL CONDITIONS

3-11. General

The AN/TRC-117(*) is fully insulated and weather-proofed for operation in hot, cold, or moderate climates. The shelter facility provides complete protection from the elements for personnel and equipment; however, under extreme conditions, the following precautions are necessary.

a. *Cold Climates*. Extreme cold causes cables and wires to become hard, brittle, and difficult to handle. Be careful when handling the cables and connecting them to the assemblage so that kinks and unnecessary loops will not result in permanent damage. Make sure that binding posts and connectors in the entrance boxes are free of frost, snow, and ice. Replace the covers on receptacles, and close the entrance box covers when they are not in use. Lower the folding side panels when the entrance boxes are open. Replace the connector cover as soon as a cable is disconnected. Never drag or place an open connector in the snow.

b. *Hot Climates*. In hot, dry climates, connectors, receptacles, and binding posts are subject to damage from dust and dirt. Replace the covers on the connectors and receptacles and close the covers on entrance boxes when they are not in use. Lower the folding side panels when the entrance boxes are open. Never place an open connector on the ground.

c. *Warm, Damp Climates*. In warm, damp climates, the equipment is subject to damage from moisture and fungi. Wipe all moisture and fungi from the equipment with a lint-free cloth.

d. *Emergency Voltage Regulator Operation*. If the CN-514/GRC fails to operate and no replacement is available, follow the procedures given in (1)

below to operate the assemblage. If the overvoltage protection device fails to operate and no replacement is available, follow the procedures given in (2) below.

(1) *Defective CN-514/GRC*.

(a) Operate the POWER DISTRIBUTION PANEL VOLT REG circuit breaker to OFF.

(b) Disconnect the cable connected to the AC POWER INPUT receptacle of the CN-514/GRC.

(c) Disconnect the cable connected to the input power receptacle (lower) on the overvoltage protection device.

(d) Connect the cable disconnected in (b) above to the input power receptacle on the overvoltage protective device.

(e) Operate all the POWER switches on the rack equipment to OFF and then perform the procedures given in paragraphs 3-4 and 3-5.

(2) *Defective overvoltage protective device*.

(a) Operate the POWER DISTRIBUTION PANEL VOLT REG circuit breaker to OFF.

(b) Disconnect the cable connected to the output power receptacle (upper) on the overvoltage protective device.

(c) Disconnect the cable connected to the 5KVA LOAD MAX receptacle on the CN-514/GRC.

(d) Connect the cable disconnected in (b) above to the 5KA LOAD MAX receptacle on the CN-514/GRC.

(e) Operate all the POWER switches on the rack equipment to OFF and then perform the procedures given in paragraphs 3-4 and 3-5.

e. *Emergency Order Wire Operation for Terminal*. If the pulse-code modulation (pcm) signal is

maintained during an order wire failure, emergency order wire communications may be established between terminals as follows:

- (1) Contact the local switchboard operator on the local communication facility.
- (2) Request the local switchboard operator to contact the distant switchboard operator over a vacant pcm channel and notify the distant terminal operator of the call and channel number.
- (3) Follow the channel monitoring procedures (para 3-9) and talk with the distant terminal operator over the vacant pcm channel.

Section III. PREPARATION FOR MOVEMENT

3-13. Disassembly of Equipment

NOTE

When the assemblage includes cryptographic material refer to AR 380-40 for handling instructions. Perform the following procedures when the AN/TRC-117(*) is moved to a different location or placed in storage.

- a. Turn off all operating equipment according to the stopping procedures in paragraph 3-10.
- b. Turn off blowers and heaters. Store the heaters in the racks provided in the assemblage.
- c. Lower and secure the desk top.
- d. Check to see that all equipments are secure in their racks.
- e. Remove the mounting straps and fixtures from the storage cabinets for use in securing the assemblage equipment.
- f. Remove the batteries from the TA-312/PT and the hand lantern for prolonged storage or long distance shipment.
- g. Secure all items on the common items panel with the clamps provided and mount the wastebasket in its bracket.
- h. Place all miscellaneous items in the storage cabinets.

3-14. Disassembly of AN/GRC-50A(V) Antenna System

a. *Removing Mast Sections From Mast AB-577/GRC.*

- (1) Unlock the snubber clamps on the upper and middle guys and release the tension on the guys.
- (2) Rotate the snubber adjustment to the closed position.
- (3) Release the handbrake and raise the mast sections to the upper limit. Lock the handbrake.
- (4) Release the six catches on the launcher and

3-12. Emergency Stopping Procedure

To turn the equipment off in an emergency, operate the POWER DISTRIBUTION PANEL MAIN circuit breaker to OFF.

CAUTION

If the equipment is turned off by using the emergency stopping procedure, operate all circuit breakers and equipment power switches to OFF before attempting to restart it.

remove the mast section carrier. Place the carrier in a convenient place, close to the mast.

(5) Install the spanner wrench in the launcher as a foot lever.

(6) Release the handbrake and operate the winch to lower the bottom mast section.

(7) Press the foot lever (step on it) and lock the handbrake.

(8) Release the clamp-opening tool (secured to the angle bracket under the top plate of the launcher frame) by removing the locking pin.

(9) Unlock the mast section clamp with the tool. Operate the winch to lower the elevator to the base of the launcher.

(10) Remove the bottom mast section and place it in the mast section carrier. Remove the mast section clamp and place it in the storage bag.

(11) Disconnect the CG-1859/U from the receptacle in the ANTENNA & VIDEO ENTRANCE BOX. Remove the UG-1374/U from the CG-1859/U and store it in the pouch on Reel, Cable RC-436/GRC.

(12) Operate the winch to raise the elevator platform to the bottom of the next mast section.

(13) Repeat the procedures given in (6), (7), (9), (10), and (12) above for the next two mast sections.

(14) Lower the next mast section about half-way and lock the handbrake.

(15) Climb up the back of the launcher and remove the middle guys from the middle guy ring. Remove the guy ring. Store the guy ring and the middle guys in the accessory bag.

(16) Repeat the procedures given in (6), (7), (9), (10) and (12) above until all but the top mast section is removed.

(17) Lower the mast section until the top of the mast is about 12 inches from the top of the launcher frame. Lock the handbrake.

b. *Lowering Launcher.*

- (1) Climb up the back of the launcher and

release the cables from the AT-903/G. Finish coiling the cables on the RC-436/GRC and place the UG-1374/U in the pouch.

NOTE

If the AB-957/GRC is used, remove the cables from both AT-903/G's.

(2) Remove the three guys from the top guy ring.

(3) Remove the spanner wrench from the launcher base.

(4) Unlock the snubber clamps on the launcher guys and release the tension on the guys. Remove the guy on the open side of the launcher.

(5) Remove the GP-2 stakes from the launcher base by rocking the launcher to loosen them and pulling them straight out.

(6) Move the mast section carrier to a position behind the launcher so that the launcher will lie on the carrier when it is lowered.

(7) Insert two GP-2 stakes in the base of the launcher to act as a hinge, and drive two GP-2 stakes into the ground next to them to prevent the launcher from slipping while it is being lowered.

(8) Lower the launcher until it is resting on the mast section carrier and remove the guys from the launcher. If the AB-957/GRC is used, remove the guys from the ends of the AB-957/GRC and from the freemoving AT-903/G.

c. Removing AT-903/G's and AB-957/GRC.

(1) If the AB-957/GRC is used, remove both AT-903/G's from the antenna mounts, remove the AB-957/GRC from the antenna adapter and remove the adapter from the top mast section.

(2) Release the handbrake and remove the last mast section through the top of the launcher. Store the mast section in the mast section carrier.

(3) Operate the winch to raise the elevator platform to the upper limit. Insert the locking pin in the rear of the elevator platform. Secure the handbrake.

(4) Position the clamp-opening tool over the angle bracket under the top plate of the launcher and insert the pin in place to secure the tool in position.

d. Disassembly of Launcher.

(1) Remove the GP-2 hinge stakes at the base of the launcher.

(2) Remove the winch from the launcher frame and secure it in the accessory bag.

(3) Lift the launcher off the mast section carrier and place it on the ground.

(4) Place the mast section carrier in the launcher and lock the six catches.

e. Removal of Guys and Stakes.

(1) Remove all of the guys from the stakes. Coil

the guys and store them in the accessory bag.

(2) Remove the stakes from the ground and clean them.

(3) Store the GP-113/G stakes in the brackets in the assemblage. Store the GP-2 and GP-112/G stakes in the accessory bags.

3-15. Packing Assemblage

(fig. FO-1)

Pack the assemblage in the order given below to avoid confusion and to prevent having to remove items after they are in place.

a. Packing Mast AB-577/GRC.

(1) If the AN/TRC-117(*) is truck-mounted, attach the loading chute to the center of the truck tailgate.

WARNING

Each Mast AB-577/GRC weighs over 200 pounds and is difficult to handle in the limited space inside the assemblage. At least two people should handle each AB-577/GRC.

(2) Move chairs and other items on the floor of the assemblage out of the way before carrying the AB-577/GRC's into the assemblage.

(3) Carry the first AB-577/GRC into the assemblage (top first) and place it on the floor against the curbside wall in the front corner. The opening in the top of the launcher will fit over the bracket on the front wall. Secure the AB-577/GRC in place.

(4) Carry the second AB-577/GRC into the assemblage (top first). Secure the second AB-577/GRC into place above the first.

(5) Secure the accessory bags on top of the second AB-577/GRC.

b. Antennas AT-903/G and Floor-Mounted Equipment.

(1) Mount the AT-903/G's in the brackets on the roadside wall of the assemblage.

(2) Mount Reels, Cable RC-436/GRC with the brackets supplied.

(3) Remove the loading chute from the tailgate and secure it in place on the floor of the assemblage.

(4) Secure Support, Antenna AB-957/GRC; Bag Assemblies BG-102A; and the doorsill bracket to the loading chute with straps.

(5) Operate the LIGHTS switches and circuit breakers to OFF; operate the MAIN circuit breaker to OFF.

(6) Turn off the generator set or the central power source for the assemblage.

(7) Disconnect the power cable and power cable stub from the power source and from the assemblage. Coil the power cable on Reel RC-435/U

and store the power cable stub in the accessory cabinet.

(8) Mount Reel RC-435/U on the loading chute and secure it in place.

(9) Disconnect the ground strap from the ground rod and from the POWER & SIGNAL ENTRANCE BOX. Store the ground strap.

(10) Pull the ground rod out of the ground and mount it in the bracket on the curbside of the assemblage.

(11) Secure the folding chair and the boarding ladder to the AB-577/GRC's with straps.

c. Checking and Securing Assemblage.

(1) Close and secure the covers on the POWER & SIGNAL ENTRANCE BOX, the AUDIO ENTRANCE BOXes, and the VIDEO & ANTENNA ENTRANCE BOX.

(2) Close and secure the blower vent covers on the front of the assemblage and the filter cover on the entrance door.

(3) Check the area to make sure that all components and parts have been recovered and stored.

(4) Check the interior of the AN/TRC-117(*)

to make sure that all components and parts have been properly secured and that all compartment doors are closed and secured.

(5) Close the entrance door and secure it.

(6) If the AN/TRC-117(*) is truck-mounted, close and secure the tailgate and check to see that the sling assembly is secure.

3-16. Repackaging for Shipment or Limited Storage

NOTE

TSEC/KG-27 permuters must be zeroized before shipment or storage. Opening the permuter access door automatically zeroizes the permuters.

Repackaging of the AN/TRC-117(*) for shipment or limited storage will normally be performed at a packaging facility or by a packaging team. If emergency packaging is required, select materials from those listed in SB 38-100. Package the AN/TRC-117(*) in accordance with the original packaging as far as possible with available materials.

CHAPTER 4

OPERATOR/CREW MAINTENANCE INSTRUCTIONS

4-1. Tools and Equipment

Repair parts, tools, test equipment and accessories issued with or authorized for use by the operator for Telephone Terminal Set AN/TRC-117 are listed in the components of end item list (COEIL) and the additional authorization list (AAL), appendixes B and C, respectively.

4-2. Lubrication Instructions

a. Use Grease, Graphite Aircraft (GGA) to lubricate the assemblage entrance door locks and latches.

b. Lubricate the following with Lubricating Oil, General Purpose, Preservative (PL-Special) or Lubricating Oil, Engine (OE-10):

- (1) Assemblage entrance door hinges.
- (2) Cover hinges of the POWER ENTRANCE BOX, SIGNAL ENTRANCE BOXes and VIDEO ENTRANCE BOXes.

c. Refer to appendix A, references, for lubrication instructions pertaining to individual components.

4-3. Preventive Maintenance Checks and Services

NOTE

Refer to TM 750-244-2 for proper procedures for destruction of this equipment to prevent enemy use.

a. General.

(1) To be sure that your equipment is always ready for your mission, you must do scheduled preventive maintenance checks and services (PMCS).

(2) When you are doing any PMCS or routine checks, keep in mind the *warnings* and *cautions*.

(3) Before operation, perform your before (B) PMCS to be sure that your equipment is ready to go.

(4) During operation, perform your during (D) PMCS. This would help you spot small troubles before they become big problems.

(5) After operation, perform your after (A) PMCS. This should help to keep your equipment in top shape.

(6) Weekly and monthly (W and M) PMCS are

important checks you make to keep serious problems from suddenly happening.

(7) Perform weekly as well as before operations PMCS's if:

(a) You are the assigned operator and have not operated the item since the last weekly.

(b) You are operating the item for the first time.

(8) Use the ITEM NO. column in the PMCS table to get the number to be used in the TM ITEM NO. column on DA Form 2404 (Equipment Inspection and Maintenance Worksheet) when you fill out the form.

(9) ROUTINE CHECKS LIKE: CLEANING, DUSTING, WASHING, CHECKING FOR FRAYED CABLES, STOWING ITEMS NOT IN USE, COVERING UNUSED RECEPTACLES AND CHECKING FOR LOOSE NUTS, BOLTS, AND SCREWS are not listed as PMCS checks. They are things that you should do anytime you see they must be done. If you find a routing check like one of those listed in your PMCS, it was listed because other maintenance personnel reported problems with this item.

(10) Defective items that cannot be corrected must be reported to higher category maintenance personnel. Records and reports of repairs and preventive maintenance must be made in accordance with procedures given in TM 38-750.

(11) Whenever an equipment is reinstalled after removal for any reason, perform the necessary (B) PMCS (table 4-1) to be sure that the item meets the readiness reporting criteria.

NOTES

The PROCEDURES column in your PMCS charts instructs you how to perform the required checks and services. Carefully follow these instructions and if tools are needed or the chart instructs you to, get organizational maintenance to do the necessary work.

If your equipment must be in operation all the time, check those items that can be checked and serviced without disturbing operation. Make the complete checks and

services when the equipment can be shut down.

(12) Operator/crew PMCS are provided in table 4-1.

(13) Organizational PMCS are performed monthly and quarterly (table 5-1).

(14) Troubleshooting procedures are provided in tables 5-2 through 5-7.

b. *Cleaning*

WARNING

Adequate ventilation should be provided while using TRICHLOROTRIFLUOROETHANE. Prolonged breathing of vapor should be avoided. The solvent should not be used near heat or open flame; the products of decomposition are toxic and irritating. Since TRICHLOROTRIFLUOROETHANE dissolves natural oils, prolonged contact with skin should be avoided. When necessary, use gloves which the solvent cannot penetrate. If the solvent is taken internally, consult a physician immediately.

(1) Use a dry, clean, lint-free cloth or brush to

remove dust or dirt. If necessary, moisten the cloth or brush with TRICHLOROTRIFLUOROETHANE. After cleaning, wipe dry with a clean cloth.

WARNING

Compressed air is dangerous and can cause serious bodily harm. Compressed air shall not be used for cleaning purposes except when reduced to less than 29 psi; and then only with protective equipment to prevent chips or particles from entering the eyes or breaking the skin of the operator or other personnel.

(2) Dry, compressed air, not to exceed 29 psi, may be used to remove dirt and dust from inaccessible places, but not air filters.

Remove rust and corrosion from metal surfaces by lightly sanding them with fine sandpaper. Brush two thin coats of paint on bare metal to protect it from further corrosion. Refer to the applicable cleaning and refinishing practices specified in TB 43-0118. Touchup painting will not be performed on COMSEC equipment (TB 750-10).

Table 4-1. Operator/Crew Preventive Maintenance Checks and Services

NOTE:

The checks in the "Interval" column are to be performed in the order listed.

B—Before operation D—During operation A—After operation W—Weekly M—Monthly

| Item No. | Interval | | | | | Item to be inspected | Procedures Check and have repaired or adjusted as necessary | Equipment is not ready/available if: |
|----------|----------|---|---|---|---|-------------------------------|---|--|
| | B | D | A | W | M | | | |
| 1 | | | | | | AN/TRC-117(*) | | Upon completion of PMCS checks, available equipment is insufficient to support the unit mission. |
| | | | | | | Generator set | <p>WARNING</p> <p>Wheels must be blocked, brakes set, and leg support down in support position before attempting to roll up the tarpaulin and before starting to assemble or set up the equipment for operation.</p> <p>a. Inspect unit for oil leaks and broken or missing parts.</p> | |
| | * | * | * | * | | Air cleaner..... | b. Inspect for dirt or moisture. | |
| | | | | * | | Fuel pump..... | c. Inspect for dirt or water. | |
| | * | * | * | * | | Fuel tank, lines, and filter. | d. Fill fuel tank. If an auxiliary fuel supply is being used, provide an adequate supply. Check fuel lines for leaks or breaks. Inspect containers for leaks, dents, rust, corrosion and damaged or missing caps. | Fuel tank or fuel lines are broken or cracked. |
| | * | | * | * | | Lubrication..... | e. Inspect the engine oil level. Lubricate the engine in accordance with the current lubrication order. | Excessive loss of oil due to burning or leakage. |
| | | | | | | | <p>CAUTION</p> <p>It is important that there be free circulation of air around the generator sets at all times during operation. Inadequate ventilation is a major cause of</p> | |

Table 4-1. Operator/Crew Preventive Maintenance Checks and Services—Continued

NOTE:

The checks in the "Interval" column are to be performed in the order listed.

B—Before operation D—During operation A—After operation W—Weekly M—Monthly

| Item No. | Interval | | | | | Item to be inspected | Procedures Check and have repaired or adjusted as necessary | Equipment is not ready/available if: |
|----------|----------|---|---|---|---|---------------------------|--|---------------------------------------|
| | B | D | A | W | M | | | |
| 2 | * | * | | | | Controls and instruments. | damage to the equipment. Never operate the generator in an enclosed area unless the exhaust gases are piped to the outside. Inhalation of exhaust fumes will result in serious illness or death. | Neither power unit operates properly. |
| | * | * | * | * | | Generator | f. Start unit and check for correct operation. | |
| | * | * | * | | | Frame | g. See that fan cover is secure and that the louvers at both ends of the generator are clean. | |
| | | | | * | | Paint | h. Inspect for cracks and bends. | |
| | * | * | | | | Grounding | i. Check for chipped paint and spot paint where required. | Unable to ground properly. |
| | | | | | | Generator trailer | j. Check grounding system for proper installation. Inspect the ground stud threads, bonding straps, and shock mounts. Tighten loose ground connections. | |
| | | | | | | | CAUTION | |
| | | | | | | | Place all tags describing condition of the trailer in a conspicuous location so that they will not be overlooked. | |
| | * | | | | * | Tires | a. Gauge tires for correct air pressure. Remove penetrating objects. Note apparent loss or air, unusual wear, or missing valve caps. | |
| | * | | | | * | Wheels | b. Inspect wheel stud nuts and hub cover screws to see that they are present and secure. | |
| | * | | | | * | Intervehicular hose | c. Inspect hose to see that it is in good condition and securely connected. | |
| | * | | | | * | Intervehicular cable | d. Inspect cable to see that it is in good condition and that all connectors are correctly assembled and secured in the mounting clips. | |
| | * | | | | * | Hydraulic tubes and hoses | e. Look under the trailer and inspect hydraulic tubes, hoses, and connections for indication of brake fluid leaks. | |
| | * | | | | * | Basic issue items .. | f. Check to see that all basic issue items are on the trailer and properly stowed. | |
| | * | * | | | * | Lights | g. Operate taillights (if tactical situation permits), observe for proper functioning. Visually inspect reflectors for breaks or cracks. | |
| | * | | | | * | Frame | h. Visually inspect frame, towing lunette and safety chains. | |
| | | | | | * | General | i. Be alert for unusual noises or improper operation of any item listed above. | |
| | | | | | * | Operating faults .. | j. Investigate and correct, or report any faults noted during operation. | |
| | | | | | * | Suspension system | k. Inspect suspension system and associated mounting parts for damage. | |
| | | | | | * | Lubrication | l. Lubricate items specified on lubrication chart. | |
| | | | | | * | Miscellaneous assemblies | m. Inspect assemblies such as air filter, air chamber, and master cylinder, swivel caster with hub or retractable support, hand brake lever for looseness of mounting or connection. | |
| | * | * | * | * | | Electric wiring ... | n. Check wiring harnesses to see that it is securely connected and supported, and that insulation is not cracked or chaffed. | |
| | | | | | | OUTSIDE | | |
| 3 | * | * | * | * | * | Shelter | a. Check for skin punctures, cracks, or open | Excessive moisture enters the shel- |

Table 4-1. Operator/Crew Preventive Maintenance Checks and Services—Continued

NOTE:

The checks in the "Interval" column are to be performed in the order listed.

B—Before operation D—During operation A—After operation W—Weekly M—Monthly

| Item No. | Interval | | | | | Item to be inspected | Procedures Check and have repaired or adjusted as necessary | Equipment is not ready/available if: |
|----------|----------|---|---|---|---|--|---|--|
| | B | D | A | W | M | | | |
| 4 | * | * | | | | Grounding | seams that could permit moisture to enter the shelter. b. Check grounding to see that it is properly installed. Tighten loose ground connections. | ter causing a potential shock hazard. Ground system connections cannot be properly tightened. |
| | * | | | | | Slings (if installed in truck) | c. Tighten turnbuckles to remove slack in sling assemblies. Do not overtighten. | |
| | * | * | | | | Power and signal cables | d. Tighten loose connections and adjust cable grips so that they relieve the connector of weight of cable. | |
| | * | * | | | | Exhaust blower vent covers | e. Be sure the exhaust blower vent covers are open and the air flow is not obstructed. | |
| | * | * | | | | Door air filter cover | f. Be sure the entrance door air filter vent cover is open and unobstructed. Clean filter weekly. | |
| | * | * | * | | | Antennas | | |
| | * | * | * | | | Guy wires | a. Proceed with caution. Check each guy for proper tension. | Antenna is not secure for any reason. |
| | * | * | * | | | Guy anchors | b. Check each guy anchor for looseness and possible shifting. | |
| | * | * | * | | | Launcher | c. Check level of launcher using the target level. | |
| | * | * | * | | | Handbrake | d. Check to see that the handbrake is firmly locked. | |
| 5 | * | * | | | | Launcher base | e. Check to see that the stakes driven through the launcher base are firmly embedded in the ground. | |
| | | | | | | INTERIOR | | |
| 5 | * | * | | | | Walls, ceiling, and floors | Check for holes, open seams, or signs of water seepage or leaks that may present a shock hazard. | A shock hazard exists. |
| 6 | * | * | * | * | | Completeness | Check to see that all items are complete and intact. All missing or damaged parts must be replaced or be on a valid requisition. | |
| 7 | * | * | | | | POWER INDICATOR neon lamp and AC VOLTS METER on POWER DISTRIBUTION PANEL | Apply power to the assemblage by starting generator set or turning on central power source. POWER INDICATOR neon lamp lights and AC VOLTS meter on POWER DISTRIBUTION PANEL indicates 115 vac \pm 6 volts. | Voltage is less than 109 volts or more than 121 volts. |
| 8 | * | | | | | POWER DISTRIBUTION PANEL | a. Operate MAIN circuit breaker to ON; AMPERES AC meter indicates zero. | High current reading is noted. |
| 9 | | | | | | Lighting | b. Sequentially operate each circuit breaker to ON; the associated indicator should light. | Circuit breaker cuts out. |
| | * | * | | | | Fluorescent lights . | NOTE Ensure that the BLACKOUT-BYPASS switch is in the BYPASS position. a. Operate LIGHTS 1 and LIGHTS 2 switches to ON. Fluorescent lamps should light. Replace lamps or starters for lamps that fail to light. | Fluorescent lights do not light regardless of the position of LIGHTS 1, LIGHTS 2, or BLACKOUT-BYPASS switches. |
| | * | * | | | | Incandescent coldstart lights | b. Operate INCANDESCENT COLD-START LIGHTS switch to ON; incandescent ceiling lights should light. Replace defective lamps. | |
| | | | | | | | CAUTION Under blackout conditions this check may be made only if the curtains are | |

Table 4-1. Operator/Crew Preventive Maintenance Checks and Services—Continued

NOTE:

The checks in the "Interval" column are to be performed in the order listed.

B—Before operation D—During operation A—After operation W—Weekly M—Monthly

| Item No. | Interval | | | | | Item to be inspected | Procedures Check and have repaired or adjusted as necessary | Equipment is not ready/available if: |
|----------|----------|---|---|---|---|-----------------------------|---|---|
| | B | D | A | W | M | | | |
| | * | * | | * | | Door microswitch . | closed. After testing, operate the BYPASS BLACKOUT switch to the BLACKOUT position. c. Operate the BYPASS BLACKOUT switch to BLACKOUT and open the door. Ceiling lights should go out. | Lights do not go out when the door is open. |
| | * | * | | * | | BYPASS BLACKOUT switch. | d. Operate the switch to the BYPASS position with the door open. Ceiling lights should light. | |
| 10 | * | * | | * | | Exhaust blowers. | Operate BLOWER switch associated with each exhaust blower to ON. Exhaust blower should operate. | Both blowers will not operate. |
| 11 | * | * | | * | | Heater 1 | a. Operate HEAT-OFF-FAN switch to HEAT, operate TEMPERATURE control and note that warm air blows from the front of the heater. b. Operate HEAT-OFF-FAN switch to FAN; fan blows air and heating element ceases to glow. c. Operate HEAT-OFF-FAN switch to OFF; fan should stop. | Heater fails to heat, fan does not blow, or excessive current causes circuit breaker to trip. |
| | * | * | | * | | Heater 2 | Repeat procedure in item 11 for heater 2. | |
| | | | | | | | NOTE Perform the following items on each system. If the AN/TRC-117 is in continuous use, perform only those items that do not interfere with the operation of the equipment. | |
| 12 | * | * | | * | | Knobs and switches | Check knobs and switches on front panels for cracks or breaks. Operate each switch and check for binding. All switches should operate smoothly. | |
| 13 | * | | | * | | Equipment ac power switches | Operate to ON; associated ac power indicators on each unit should light. Blowers should operate. TD-204/U ALARMS NO CABLE CURRENT indicator should light. | One or more blowers fail to operate. |
| 14 | * | | | * | | Multiplexer TD-204/U | a. Operate CABLE POWER switch to ON. ALARMS NO CABLE CURRENT indicator goes out. | ALARMS NO CABLE CURRENT indicator fails to go out. |
| | | | | * | | Orderwire circuit . | b. Operate TALK-OFF-SIG switch to SIG for 2 seconds or between SIG and OFF for called terminal identification. c. Operate TALK-OFF-SIG switch to TALK and talk with the called station. d. Request distant terminal to signal by order wire and operate TALK-OFF-SIG switch to OFF. e. When buzzer sounds and CALL indicator lights, operate TALK-OFF-SIG switch to TALK and answer the call. f. When the check is completed, set the TALK-OFF-SIG switch to OFF. | Order wire fails to operate. |
| | | | | * | | METER SELECT switch. | g. Operate switch to the following positions and check for proper indication on TEST ALIGN meter. <div style="display: flex; justify-content: space-between;"> <div> <i>Position</i> TIMING IN PCM IN-1 </div> <div> <i>Indication</i> Green area Green area </div> </div> | Indication is not proper. |

Table 4-1. Operator/Crew Preventive Maintenance Checks and Services—Continued

NOTE:

The checks in the "Interval" column are to be performed in the order listed.

B—Before operation D—During operation A—After operation W—Weekly M—Monthly

| Item No. | Interval | | | | | Item to be inspected | Procedures Check and have repaired or adjusted as necessary | Equipment is not ready/available if: |
|----------|----------|---|---|---|---|--|--|--------------------------------------|
| | B | D | A | W | M | | | |
| 15 | | | | | | | <div><div>Position</div><div>Indication</div><div>PCM IN-2</div><div>Green area</div><div>CABLE I</div><div>Yellow area</div><div>CABLE V</div><div>10.8 times number of TD-206/G's plus 13.</div></div> <div>NOTE</div> <div>If CABLE V position is checked with loss of timing in signal; use 14.8 times number of TD-206/G's plus 13.</div> <div>h. Operate switch to SERV FAC.</div> | |
| | | | * | | | Multiplexer TD-754/G | a. Perform item 12 above. | |
| | | | | * | | Knobs and switches | <div>CAUTION</div> <div>Perform b and c below only when there is no traffic.</div> | |
| | | | | * | | PWR and CABLE CURRENT switches and cable current alarm circuit. | b. Operate PWR switch to ON and observe that power and CABLE CUR indicators light. Operate CABLE CURRENT switch to ON and observe that the CABLE CUR indicator goes out. | |
| | | | | * | | Traffic (pcm) alarm circuit. | c. Notify operator at opposite end of cable link to momentarily operate POWER switch on TD-352/U to OFF. Observe that PCM IN indication goes out and then lights. | |
| | * | * | | * | | Power circuit checks. | d. With the METER SEL switch set to SERV FAC, operate the SERV SEL switch to the following positions and check for proper indication on the TEST ALIGN meter. | Indication is not proper. |
| | | | | | | <div>SERV SEL</div> <div>switch</div> <div>position</div> <div>REF</div> <div>+28V</div> <div>+12V</div> <div>+5V</div> <div>-6V</div> | <div>TEST ALIGN</div> <div>meter</div> <div>indication</div> <div>Yellow band</div> <div>Green band</div> <div>Green band</div> <div>Green band</div> <div>Green band</div> | |
| | * | * | | * | | Audible alarm circuit test. | e. Press the BUZZER ON switch several times. Note the audible alarm is alternately energized and silenced. | |
| | | | * | * | | Order wire circuit . | f. Perform the procedures in item 14b through f above. | |
| | | | | * | | Multiplexer TD-352/U | a. Perform item 12 above. | |
| 16 | * | * | | * | | Knobs and switches | <div>NOTE</div> <div>Perform items b, c, and d below only during authorized downtime.</div> | |
| | * | | | * | | POWER switch . . . | b. Operate to ON and observe that the amber indicator lamp lights. | |
| | * | | | * | | Alarm indication . . | c. Momentarily remove connector from PCM IN receptacle, noting that the audible alarm sounds and FRAME lamp lights. Reconnect the cable to PCM IN receptacle. | |
| | * | | | * | | Service facility panel | d. Operate the CHAN 1-12 switch to OFF and the AUX switch to OUT. | |
| | * | | | * | | METER SELECT switch | e. Operate switch to following positions, and observe the indication on the TEST ALIGN meter. | Indication is not proper. |
| | | | | | | <div>Position</div> <div>Timing in</div> | <div>Meter Indication</div> <div>Green</div> | |
| | | | | | | | | |

Table 4-1. Operator/Crew Preventive Maintenance Checks and Services—Continued

NOTE:

The checks in the "Interval" column are to be performed in the order listed.

B—Before operation D—During operation A—After operation W—Weekly M—Monthly

| Item No. | Interval | | | | | Item to be inspected | Procedures Check and have repaired or adjusted as necessary | Equipment is not ready/available if: |
|----------|----------|---|---|---|---|---|---|--|
| | B | D | A | W | M | | | |
| 17 | | | | | | | <div><div><div>Position</div><div>Meter Indication</div></div><div>PCM INGreen</div><div>NOISE GENGreen</div><div>PCM FROM AUXGreen</div><div>(only when AUX is connected)</div><div>SYNC INGreen</div><div>(only when SYNC IN receptacle used)</div></div> | |
| | * | | | | * | AUDIO GAIN ... | f. Operate METER SELECT switch to SERV FAC and SERV SEL switch to OSC. Observe the TEST ALIGN meter for a hairline indication. Adjust OSC ADJUST control if TEST ALIGN meter does not have proper indication. | Indication is not proper. |
| | * | | | | * | Service facility panel | g. Operate the CHAN 1-12 switch to OFF and the AUX switch to OUT. | |
| | * | | | | * | SERV SEL switch. | h. Operate switch to the following positions and observe the indication on the TEST ALIGN meter. | |
| | | | | | | | <div><div><div>Position</div><div>Meter Indication</div></div><div>-5.2Green</div><div>+25Yellow</div><div>+10Yellow</div><div>+4.5Yellow</div><div>-4.5Yellow</div><div>-12Yellow</div></div> | |
| | * | * | | | * | Meter selector switch of CV-1548/G | <div>NOTE</div> <div>The following does not apply to CV-1548A/G.</div> <div>Operate the switch to the following positions and check for correct indications on the TEST ALIGN meter.</div> | Indication is not proper. |
| | | | | | | | <div><div><div>Position</div><div>Indication</div></div><div>-Yellow</div><div>+Yellow</div><div>20~DRIVEYellow</div><div>1600~DRIVEGreen</div></div> | |
| | * | * | | | * | TSEC/KG-27 MONITOR SELECT switch (if installed) | Set the switch to each of the following positions, the MONITOR lamp should light in each position. | |
| | | | | | | | <div><div><div>Position</div></div><div>4VB</div><div>12V</div><div>-6V</div><div>4VR</div><div>-10V</div></div> | |
| | * | * | | | * | Intercommunication Station LS-147C/FI. | a. Connect WD-1/TT field wire from the INTERCOM binding posts on the SIGNAL ENTRANCE BOX to the corresponding binding posts of another assemblage containing an LS-147C/FI. Turn on the units and allow 5 minutes for warm up. Establish communications between the unit under test and the other assemblage. | Normal conversation cannot be established. |
| | * | * | | | * | | b. Repeat the procedure above for all INTERCOM binding posts in both entrance boxes. | |
| | * | * | | | * | | c. Repeat a above with the field wire connected to the INTERCOM posts on the POWER ENTRANCE BOX. | |

Table 4-1. Operator/Crew Preventive Maintenance Checks and Services—Continued

NOTE:

The checks in the "Interval" column are to be performed in the order listed.

B—Before operation D—During operation A—After operation W—Weekly M—Monthly

| Item No. | Interval | | | | | Item to be inspected | Procedures Check and have repaired or adjusted as necessary | Equipment is not ready/available if: |
|----------|----------|---|---|---|---|---------------------------------|---|---|
| | B | D | A | W | M | | | |
| 20 | * | | | * | | Telephone Set TA-312/PT. | a. Connect a TA-312/PT with WD-1/TT field wire to the PHONE binding posts of the SIGNAL ENTRANCE BOX. b. Turn handcrank on the TA-312/PT just installed; ringer of TA-312/PT in shelter should ring. c. Establish communications between the two telephone sets. d. Repeat the procedure above on all PHONE binding posts at both SIGNAL ENTRANCE BOXes. e. Repeat a, b, and c above at the PHONE binding post on the POWER ENTRANCE BOX. | Ringer is not operational, sidetone cannot be heard when speaking into handset, and normal conversation cannot be established. |
| | * | | | * | | | | |
| | * | | | * | | | | |
| | * | | | * | | | | |
| | * | | | * | | | | |
| | * | | | * | | | | |
| | | | | | | | SYSTEM RADIO CHECKS NOTE | |
| 21 | * | | | * | | | 1. Preset the radio set using the initial control settings in paragraph 3-4a. | |
| | * | | | * | | | 2. On CN-514/GRC, set MANUAL-AUTOMATIC switch to MANUAL and POWER switch to ON. | MANUAL and POWER indicators fail to light. |
| | * | | | * | | | 3. Observe REGULATED OUTPUT VOLTAGE meter indication. Adjust RAISE-LOWER switch until meter indicates 115 v. | Meter fails to indicate 115V \pm 6V after adjustment. |
| | * | | | * | | | 4. Turn POWER switch to OFF for a few seconds and then to ON. | Meter fails to return to 115V \pm 6V. |
| | * | | | * | | | 5. Turn on the overvoltage protection device. | |
| | * | | | * | | T-893(P)/GRC ... | a. Connect antenna cable to the TO ANT receptacle. | |
| | * | | | * | | R-1331(P)/GRC ... | b. Operate AC POWER switch to ON. | AC POWER indicator fails to light. |
| | * | | | * | | AM-1955A/GRC or AM-1956A/GRC | c. Adjust OSCILLATOR control for a peak indication on the receiver multimeter after setting wavemeter to selected channel. | Multimeter fails to peak. |
| | * | | | * | | | d. Adjust WAVEMETER control for a peak indication on the multimeter. | WAVEMETER dial fails to indicate within two divisions of the reading indicated on the WAVE-METER CHART for the receive channel. |
| | | | | | | | NOTE Readjust OSCILLATOR control if desired reading on WAVEMETER CHART is not attained. | |
| | * | | | * | | R-1331(P)/GRC... | e. Set multimeter selector switch to REC SIGNAL. If signal is being received, adjust OSCILLATOR control for a peak indication on multimeter. | |
| | | | | | | | NOTE Do not turn on T-893(P)/GRC to perform the next step. | |
| | * | | | * | | T-893(P)/GRC ... | f. Adjust REC SIG-2 control for a peak indication on the receiver multimeter. | Multimeter fails to peak. |
| | | | | | | | Disconnect the antenna cable from the TO ANT receptacle and connect a CG-718B/U cable between the ANT receptacle and Dummy Load DA-189/GRC. | |
| | * | | | * | | PP-2054/GRC... | g. Set AC POWER switch to ON and OPERATE-STANDBY switch to OPERATE. | FIL, LV, and HV indicators fail to light after 75 seconds. |
| | | | | | | | NOTE If buzzer sounds silence it with BUZZER OFF switch. Wait 15 minutes | |

Table 4-1. Operator/Crew Preventive Maintenance Checks and Services—Continued

NOTE:

The checks in the "Interval" column are to be performed in the order listed.

B—Before operation **D**—During operation **A**—After operation **W**—Weekly **M**—Monthly

| Item No. | Interval | | | | | Item to be inspected | Procedures Check and have repaired or adjusted as necessary | Equipment is not ready/available if: |
|----------|----------|---|---|---|---|----------------------|---|---|
| | B | D | A | W | M | | | |
| * | | | | * | | T-893(P)/GRC ... | before proceeding with the tuning procedure. h. Set multimeter selector switch to OSC and adjust Amplifier-oscillator (AM-1958/GRC only) OSC control for a peak indication. i. Set multimeter selector switch to MAIN TUNE and adjust for a peak indication. j. Readjust OSC and MAIN TUNING controls alternately for a peak indication. Lock the MAIN TUNING control. k. Set multimeter selector switch to MIXER for a peak indication. Lock the MIXER control. l. Set WAVEMETER dial to the OUT FREQ. indication listed in the WAVEMETER chart for the desired frequency. m. Set multimeter selector switch to AMP and tune the AMP control for a peak indication. n. Turn the AFC CORRECTION control for a peak indication. o. Set multimeter selector switch to PWR OUT and tune the POWER OUT controls. If meter goes full scale, press the METER SHUNT button and continue adjusting the POWER OUT controls while holding the METER SHUNT control pressed. Repeat from step m. p. Set multimeter selector switch to REF PWR and note the meter indication, then set the switch to PWR OUT. q. Set multimeter selector switch to AFC LEV and adjust the AFC LEV control for a peak indication. Repeat AFC TUNE and AFC LEV adjustments. r. Set AFC selector switch to ODD or EVEN (depending upon selected channel). s. Rotate AFC CORRECTION control in either direction until AFC meter indicates ± 40 (± 10 for AM-1958A/GRC), then return AFC control to original setting. t. Set multimeter selector switch to OUT FREQ and tune WAVEMETER control for a peak indication. | Multimeter fails to peak when OSC control is adjusted. Multimeter fails to peak. Multimeter fails to peak. Multimeter fails to peak. Multimeter fails to peak. Multimeter fails to peak. AFC meter fails to return to ± 10 divisions of midscale. No output is indicated. If this occurs, repeat tuning procedure. |
| * | | | | * | | | NOTE Entire tuning procedure must be repeated if reading specified cannot be attained. | Meter fails to indicate approximately ten times the reading noted. Multimeter fails to peak. |
| * | | | | * | | | u. Observe DUMMY LOAD meter. | AFC meter fails to indicate ± 40 or fails to recenter after deflection (± 10 for AM-1958A/GRC). |
| * | | | | * | | PP-2054/GRC | v. Set OPERATE-STAND BY switch to STAND BY. w. Disconnect the CG-718B/U from the TO ANT receptacle and reconnect the antenna cable to the TO ANT receptacle. x. Set switch to OPERATE. Repeat step 20 for SYSTEM 2 radio set. | Multimeter fails to peak or WAVE-METER fails to indicate within ± 2 divisions of the OUT FREQ reading in the WAVEMETER CHART. Meter fails to indicate between 12 and 20 watts for AM-1958A/GRC or between 15 and 30 watts for AM-1957A/GRC. |
| * | | | | * | | | | Same as step 21. |

Table 4-1. Operator/Crew Preventive Maintenance Checks and Services—Continued

NOTE:

The checks in the "Interval" column are to be performed in the order listed.

B—Before operation D—During operation A—After operation W—Weekly M—Monthly

| Item No. | Interval | | | | | Item to be inspected | Procedures Check and have repaired or adjusted as necessary | Equipment is not ready/available if: |
|----------|----------|---|---|---|---|---------------------------------|--|--|
| | B | D | A | W | M | | | |
| 22 | | | | * | | Final system performance check. | <p>NOTE</p> <p>Only perform the following system performance checks when the equipment has not been operated for the interval indicated.</p> <p>CABLE TERMINAL CHECKS</p> <p>NOTES</p> <ol style="list-style-type: none"> 1. Connect 1 mile of CX-11230/G cable or CX-4245/G cable between the SYSTEM 1 and SYSTEM 2 connectors of the VIDEO ENTRANCE BOX. 2. On the SIGNAL ENTRANCE BOX, connect one telephone set to CHANNEL 1 binding posts for SYSTEM 1 and connect the second telephone set to CHANNEL 1 binding posts for SYSTEM 2. 3. Set MILE switches on both cable combiners to 1 mile. 4. Set BINDING POST-CABLES switches on the SIGNAL ENTRANCE panel to BINDING POST. | |
| 23 | | | | * | | Multiplexer TD-204/U. | <ol style="list-style-type: none"> a. Operate AC POWER switch to ON at both cable combiners. b. Operate CABLE POWER switch to ON, and silence buzzer with BUZZER OFF switch on both cable combiners. c. Operate SYSTEM 1 cable combiner TALK-OFF-SIG switch to SIG. d. Operate SYSTEM 1 cable combiners TALK-OFF-SIG switch to TALK, and talk with SYSTEM 2 cable combiner. e. Repeat c and d above from SYSTEM 2 cable combiner to SYSTEM 1 cable combiner. | <ol style="list-style-type: none"> a. AC POWER indicator does not light, ALARMS NO CABLE CURRENT indicator does not light, buzzer does not sound, or blower does not operate. b. ALARMS NO CABLE CURRENT indicator does not go out, and buzzer does not silence. c. Call indicators SYSTEM 1 and SYSTEM 2 cable combiners do not light, and buzzers do not sound. d. Loud and clear order wire conversation is not heard. e. Same as c and d above. |
| 24 | | | | * | | Multiplexer TD-352/U. | <ol style="list-style-type: none"> a. Connect Headset-Microphone H-91A/U to the TALK-MONITOR receptacle on the front panel. b. Operate the CHAN switch to the desired channel and establish conversation. c. If another channel is to be monitored, operate the CHAN 1-12 switch as required and listen to the receiver of the H-91A/U. d. Operate the CHAN 1-12 switch to OFF. e. Operate the SERV SEL switch to +25. f. Disconnect the H-91A/U from the TALK MONITOR connector. | <ol style="list-style-type: none"> b. Loud and clear conversation is not established. c. Loud and clear conversation is not established on the selected channel. |

CHAPTER 5

ORGANIZATIONAL MAINTENANCE INSTRUCTIONS

Section I. PREVENTIVE MAINTENANCE CHECKS AND SERVICES

5-1. General

Organizational maintenance of Radio Terminal Set AN/TRC-117(*) includes the procedures outlined in this chapter as well as those authorized to be performed by the operator/crew in chapter 4. Table 5-1 lists the required PMCS for the organizational repair person.

5-2. Touchup Painting

CAUTION

Solar reflecting paint per MIL-E-46061 (MO) has been used to paint the exterior of

some shelter facilities to lower the inside temperature when the shelter is exposed to the direct rays of the sun. Before doing any touchup painting on the exterior, check for a caution notice on the inside of the entrance door. If the solar reflecting paint has been used, refer to TB 43-0124 for the proper procedures to be used in repainting or touchup painting. Do not use any other paint on shelter facilities painted with the solar reflecting paint.

Table 5-1. Organizational Preventive Maintenance Checks and Services

NOTE

The Checks In The "Interval" Column Are To Be Performed In The Order Listed.

M—Monthly Q—Quarterly

| Item No. | Interval | | Item to be inspected | Procedures Check and have repaired or adjusted as necessary |
|----------|----------|---|--|--|
| | M | Q | | |
| | | | <i>OUTSIDE</i> | |
| 1 | * | | Shelter skin and hardware. | Paint blistered, pitted, and flaking areas and bare metal spots (such as steps, entrance box covers, skids, towing eyes, etc). |
| 2 | * | | Entrance door. | a. Tighten loose screws and bolts. |
| | * | | | b. Lubricate door locks and latches with Grease, Molybdenum Disulfide (GMD); lubricate hinges with Lubricating Oil, General Purpose (FED VV-L-800), or Lubricating Oil, Engine (MIL-L-2104). |
| 3 | * | | Entrance boxes. | c. Put gasket cement on loose gaskets. |
| | | | | Lubricate piano-type hinges of covers with oil (FED VV-L-800 or MIL-L-2104). |
| | | | <i>INSIDE</i> | |
| 4 | * | | Interior surfaces. | Paint blistered, pitted, and flaking areas and bare metal spots (such as floor, ceiling, walls, panels, racks, etc). |
| 5 | * | | Exhaust fans. | a. Lubricate all points with oil (FED VV-L-800 or MIL-L-2104). |
| 6 | * | | Fire extinguisher. | b. Clean motor fan housing. |
| | | | | a. Refill if weight of contents is less than prescribed. |
| | | | | b. Replace if valve assembly is damaged or there is evidence of corrosion. |
| | | | NOTE | |
| | | | Carbon dioxide fire extinguishers should be hydrostatically tested every 5 years. If the last date stamped into the neck of the body is over 5 years, remove and tag it "un-serviceable and replaced." Replace with a good extinguisher. | |

Table 5-1. Organizational Preventive Maintenance Checks and Services — Continued

NOTE

The Checks In The "Interval" Column Are To Be Performed In The Order Listed.

M—Monthly Q—Quarterly

| Item No. | Interval | | Item to be inspected | Procedures Check and have repaired or adjusted as necessary |
|----------|----------|---|-------------------------------|---|
| | M | Q | | |
| 7 | | * | First aid kit. | Replace if case is broken or damaged. Replace parts that have been used. |
| 8 | | * | <i>GENERAL</i> Components: | |
| | | * | a. Inventory. | a. Inventory equipment; requisition missing or defective parts. |
| | | * | b. Location of parts. | b. Check to see that all components are mounted or stowed in assigned places; except those being used (power, signal, and interconnecting cables). |
| | | * | c. Publications. | c. Requisition all operator and organizational maintenance manuals covering the assemblage and its components that are not on hand or in usable condition (including all current changes to the publications). |
| 9 | | * | Modification work orders. | Check to see if any MWO's are required for the assemblage or its components. Check equipment to see if current MWO's have been applied and MWO number stamped as required. Perform or request modification as applicable. |

Section II. TROUBLESHOOTING

5-3. General Troubleshooting

Trouble symptoms are discovered through the built-in alarms in the equipment components, incorrect indications in preventive maintenance checks and services (tables 4-1 and 5-1) and from other terminals or repeaters in the system. Use the built-in tests for the individual components listed in tables 5-2 through 5-8 to identify problems. When an incorrect indication occurs, determine the complete

symptom and then refer to the troubleshooting tables in paragraphs 5-4, 5-5 and 5-6 to find the probable cause and corrective measure.

NOTE

When using tables 5-2 through 5-8 make careful observations because the significance of an incorrect or out-of-tolerance indication will be different from that of a zero indication.

Table 5-2. Multiplexer TD-202/U Built-In Tests^a

| METER SELECT switch position | Normal TEST ALIGN meter indication |
|------------------------------|---|
| TIMING IN | Green area |
| PCM IN-1 | Green area |
| PCM IN-2 | Green area (24-channel operation only). |
| TO RADIO XMTR | Yellow area |
| FROM RADIO RCVR. | Yellow area |
| SERV FAC | Regulated voltages normal |

^aRefer to figure 2-47 for loopback tests.Table 5-3. Multiplexer TD-204/U Built-In Tests^a

| METER SELECT switch position | Normal TEST ALIGN meter indication |
|------------------------------|--|
| TIMING IN | Green area |
| PCM IN-1 | Green area |
| PCM IN-2 | Green area (24-channel operation only). |
| CABLE I | Yellow area |
| CABLE V | 13 plus 10.8 times number of TD-206/G's in line. |
| SERV FAC. | Regulated voltages normal |

NOTE

If TIMING IN indication is not in green area, use 14.8 as factor for CABLE V check instead of 10.8.

^aRefer to figure 2-51 for loopback tests.
5-2 Change 2

Table 5-4. Multiplexer TD-352/U Built-In Tests

| METER SELECT switch position | Normal TEST ALIGN meter indication |
|------------------------------|---------------------------------------|
| TIMING IN | Green |
| PCM IN | Green |
| NOISE GEN | Green |
| PCM FROM AUX | Green (only with security equipment). |
| SYNC IN | Green (only when used as slave) |
| SERV FAC | Regulated voltages normal |

Table 5-5. Converter, Telephone Signal CV-1548/G Built-In Tests

| Meter selector switch position | Normal TEST ALIGN meter indication |
|--------------------------------|------------------------------------|
| - | Yellow |
| + | Yellow |
| 20~DRIVE | Yellow |
| 20~ | Yellow |
| 1600~ | Green |

NOTE

Note applicable to CV-1548/G.

Table 5-6. Transmitter, Radio T-893(P)/GRC Built-In Tests

NOTE

Make the following checks with either the AM-1957/GRC or AM-1958A/GRC installed in the T-893(P)/GRC.

| Multimeter selector switch position | Multimeter indication |
|-------------------------------------|-----------------------|
| OSC (AM-1958A/GRC only) | Greater than 10 |
| MAIN TUNE | Greater than 10 |
| MIXER | Greater than 10 |
| AMP | Greater than 10 |
| OUT FREQ | Greater than 10 |
| PWR OUT | Greater than 10 |
| AFC LEV | Greater than 10 |
| 1 KC MOD | Green area |
| PCM IN | Green area |

Table 5-7. Receiver, Radio R-1331(P)/GRC Built-In Tests

NOTE

Make the following checks with the AM-1955A/GRC or AM-1956A/GRC installed in the R-1331(P)/GRC.

| Multimeter selector switch position | Multimeter indication |
|-------------------------------------|--|
| OSC | Greater than 10 |
| REC SIGNAL | Greater than 10 (acceptable signal from distant transmitter required). Press AFC DISABLE switch. Reading remains constant. |
| ORDER WIRE | Green area |
| PCM OUT | Green area |

Table 5-8. TSEC/KG-27 Built-In Tests

| MONITOR SELECT switch position | MONITOR lamp indicator |
|--------------------------------|--------------------------------|
| 4VB | Lights in all switch positions |
| 12V | |
| -6V | |
| 4VR | |
| -10V | |

5-4. System Troubleshooting

a. Troubleshooting. The troubleshooting tables 5-9 through 5-17 list trouble symptoms, probable troubles, and corrective measures for each configuration of the AN/TRC-117(*). Use the table or tables applicable to the connected configuration.

NOTE

For TSEC/KG-27 faults use tables 5-15, 5-16, and 5-17. As a result of MOD-1 to the TSEC/KG-27, the TSEC/KG-27 will

not go into alarm if receive transmission is interrupted. The only indication will be a rushing noise on all channels. If interruption is before receiver multiplexer, a check of the TSEC/KG-27 monitor lights will indicate receive TIM and PCM will be out. The multiplex equipment should show FRAME ALARM. If interruption is after receive multiplexer, only receive PCM light will be out and multiplexer will now show FRAME ALARM.

Table 5-9. Radio Terminal Troubleshooting

| Item No. | Symptom | Possible trouble | Corrective measure |
|----------|---|---|--|
| 1 | ALARMS FRAME indicator of TD-352/U lights, buzzer sounds, and TEST ALIGN meter indicates in green area with METER SELECT switch at PCM IN and TIMING IN. | Defective TD-352/U. | Troubleshoot TD-352/U (appx A). |
| 2 | ALARMS FRAME indicator of TD-352/U lights, buzzer sounds, and TEST ALIGN meter does not indicate in green area with METER SELECT switch at PCM IN and/or TIMING IN. TD-202/U and AN/GRC-50A(V) indicate normally. | a. Defective cable between TD-352/U and TD-202/U. b. Defective TD-202/U. | a. Check and replace if necessary. b. Troubleshoot TD-202/U (appx A). |
| 3 | ALARMS FRAME indicator of TD-352/U and ALARMS TRAFFIC indicator of TD-202/U light, buzzer sounds, TEST ALIGN meter of TD-202/U does not indicate in green area with METER SELECT switch at FROM RADIO RCVR. AN/GRC-50A(V) operates normally, order wire normal. | Defective pcm component at distant terminal or repeater. | Request distant terminal or repeater troubleshooting. |
| 4 | Order wire very noisy or no reception, but all other indications on TD-352/U, TD-202/U and AN/GRC-50A(V) are normal. | a. Defective CX-7872/TCC cable between TD-202/U and R-1331(P)/GRC. b. Defective TD-202/U. | a. Check and replace if necessary. b. Troubleshoot TD-202/U (appx A). |
| 5 | ALARMS FRAME indicator of TD-352/U and ALARMS TRAFFIC indicator of TD-202/U light and TEST METER does not indicate in green area with METER SELECT switch at FROM RADIO RCVR, all indications on AN/GRC-50A(V) are normal except for noisy or no order wire communications. | a. Defective CG-409H/U cable between R-1331(P)/GRC and TD-202/U. b. Defective R-1331(P)/GRC. c. Defective cable assembly or wideband transformer between TD-202/U and CG-409H/U. | a. Check and replace if necessary. b. Troubleshoot R-1331(P)/GRC (appx A). c. Check cable assembly or wideband transformer by substitution. |
| 6 | ALARMS FRAME indicator of TD-352/U, ALARMS TRAFFIC indicator of TD-202/U, and R-1331(P)/GRC SQUELCH NO SIGNAL indicators light, buzzer sounds, and no order wire communications. | a. Defective antenna cable b. Defective Antenna AT-903/G. c. Defective R-1331(P)/GRC. d. AT-903/G not properly oriented. e. Defective T-893(P)/GRC at distant terminal or repeater. | a. Check and replace if necessary. b. Check and replace if necessary. c. Troubleshoot R-1331(P)/GRC (appx A). d. Check orientation. e. Keep AN/GRC-50A(V) operating on assigned frequency. Periodically try order wire and wait for response. Send person to distant terminal or repeater. |
| 7 | In 24-channel operation, both TD-352/U's have this symptom. Distant terminal or repeater indicates loss of pcm, no indication on TEST ALIGN meter of local TD-202/U with METER SELECT switch at TO RADIO XMTR. | Defective TD-202/U. | Troubleshoot TD-202/U (appx A). |

Table 5-9. Radio Terminal Troubleshooting—Continued

| Item No. | Symptom | Possible trouble | Corrective measure |
|----------|--|--|---|
| 8 | Distant terminal or repeater indicates loss of pcm, no indication on TEST ALIGN meter of local TD-202/U with METER SELECT switch at TIMING IN, PCM IN-1, or TO RADIO XMTR. | a. Defective cables between TD-352/U and TD-202/U. b. Defective TD-352/U. NOTE In 24-channel operation, if TEST ALIGN meter of TD-202/U indicates loss of either PCM IN-1 or PCM IN-2, check associated TD-352/U and interconnecting cables. | a. Check and replace if necessary. b. Troubleshoot TD-352/U (appx A). |
| 9 | Distant terminal or repeater indicates loss of pcm. Local T-893(P)/GRC indicates loss of pcm input. All indications on local TD-352/U and TD-202/U are normal. | a. Defective CG-409H/U cable between TD-202/U and T-893(P)/GRC. b. Defective cable assembly or wideband transformer between TD-202/U and CG-409H/U. | a. Check and replace if necessary. b. Check cable assembly or wideband transformer by substitution. |
| 10 | Switchboard operator indicates loss of a specific channel or only one way communication on a specific channel. All other indications are normal. | a. Defective TD-352/U. b. Defective CV-1548/G c. Defective CX-7870/TCC between CCV-1548/G and TD-352/U. d. Defective field wire in line. e. Defective TD-352/U or CV-1548/G at distant terminal. | a. Troubleshoot TD-352/U (appx A). b. Troubleshoot CV-1548/G (appx A). c. Check and replace if necessary. d. Check and repair as required. e. Request distant terminal troubleshooting. |
| 11 | Switchboard operator reports high noise level, distortion or hum on channels, but all other indications are normal. | a. Defective TD-352/U. b. Distant TD-352/U or TD-202/U defective. | a. Troubleshoot TD-352/U (appx A). b. Request distant terminal or repeater troubleshooting. |
| 12 | Order wire garbled and noisy; all other indications normal. | a. Defective TD-202/U. b. Defective AN/GRC-50A(V). | a. Troubleshoot TD-202/U (appx A). b. Troubleshoot AN/GRC-50A(V) (appx A). |
| 13 | No indication on TEST ALIGN meter of TD-352/U with METER SELECT switch at PCM FROM AUX (secure operation only). | a. Defective cables between TSEC/KG-27 and TD-352/U. b. Defective TSEC/KG-27. | a. Check and replace if necessary. b. Troubleshoot TSEC/KG-27. |
| 14 | All channels are noisy and all other indications are normal (secure operation only). | Defective TSEC/KG-27. | Troubleshoot TSEC/KG-27. |
| 15 | No indication on TEST ALIGN meter of slave TD-352/U with METER SELECT switch at SYNC IN (24-channel operation). | a. Defective cable between master and slave TD-352/U. b. Defective master TD-352/U. c. Defective slave TD-352/U. Defective CV-1548/G. | a. Check and replace if necessary. b. Troubleshoot master TD-352/U. c. Troubleshoot slave TD-352/U. Troubleshoot CV-1548/G (appx A). |
| 16 | Switchboard operator indicates that no signaling is available on any two-wire channel. | | |
| 17 | Incorrect indication on TEST ALIGN meter of TD-202/U with METER SELECT switch at TO RADIO XMTR. | a. Video and level adjustment required on TD-202/U. b. Defective TD-202/U. | a. Adjust OL control on panel 5A2 of TD-202/U (para 2-15). b. Troubleshoot TD-202/U (appx A). |
| 18 | Incorrect indication on TEST ALIGN meter of TD-202/U with METER SELECT switch at FROM RADIO RCVR. | a. Video level adjustment required on TD-202/U. b. Defective TD-202/U. | a. Adjust RL control on panel 5A3 of TD-202/U (para 2-15). b. Troubleshoot TD-202/U (appx A). |
| 19 | Switchboard operator reports high noise level on all channels; all other indications normal. | Defective TD-202/U. | Troubleshoot TD-202/U (appx A). |
| 20 | ALARM FRAME indicator on slave TD-352/U alternately lights and extinguishes (24-channel operation). | a. Defective cable from master TD-352/U to slave TD-352/U. b. Defective master or slave TD-352/U at distant terminal. | a. Check and replace if necessary. b. Request distant terminal troubleshooting. |

Table 5-10. Radio Repeater Troubleshooting

| Item No. | Symptom | Possible trouble | Corrective measure |
|----------|--|--|---|
| 1 | ALARMS TRAFFIC indicator of TD-202/U lights. No indication on TEST ALIGN meter with METER SELECT switch at FROM RADIO RCVR. AN/GRC-50A(V) operates normally and order wire is normal. | Defective pcm component at distant terminal or repeater. | Request distant terminal or repeater troubleshooting. |
| 2 | ALARMS TRAFFIC indicator of TD-202/U lights. No indication on TEST ALIGN meter with METER SELECT switch at FROM RADIO RCVR. AN/GRC-50A(V) operates normally except for noisy order wire. | a. Defective CG-409H/U cable between T-893(P)/GRC and TD-202/U. b. Defective cable assembly or wideband transformer between TD-202/U and CG-409H/U. c. Defective AN/GRC-50A(V). | a. Check and replace if necessary. b. Check cable assembly or wideband transformer by substitution. c. Troubleshoot AN/GRC-50A(V). |
| 3 | ALARMS TRAFFIC indicator of TD-202/U lights. R-1331(P)/GRC SQUELCH NO SIGNAL indicator lights, buzzer sounds, and no order wire. | a. Defective antenna cable. b. Defective Antenna AT-903/G. c. Defective R-1331(P)/GRC. d. AT-903/G not properly oriented. e. Defective T-893(P)/GRC at distant terminal or repeater. | a. Check and replace if necessary. b. Check and replace if necessary. c. Troubleshoot R-1331(P)/GRC (appx A). d. Check orientation. e. Keep R-1331(P)/GRC operating on an assigned frequency. Periodically try order wire and wait for response. Send person to distant terminal or repeater. |
| 4 | Distant terminal or repeater indicates loss of pcm. No indication on TEST ALIGN meter of local TD-202/U with METER SELECT switch at TIMING IN, PCM IN-1, or TO RADIO XMTR. Other TD-202/U has no alarms. | a. Defective cable between TD-202/U's. NOTE In 24-channel operation, if TEST ALIGN meter of TD-202/U indicates loss of either PCM IN-1 or PCM IN-2, check associated cable. At a drop and insert repeater check associated TD-352/U. b. Defective TD-202/U (no output to T-893(P)/GRC). c. Other TD-202/U defective (no pcm or timing out). | a. Check and replace if necessary. b. Troubleshoot TD-202/U (appx A). c. Troubleshoot TD-202/U (appx A). |
| 5 | No order wire communication available in one radio link, all other indications are normal. | a. Defective CX-7872/TCC between associated TD-202/U and R-1331(P)/GRC. b. Defective associated TD-202/U. c. Defective associated R-1331(P)/GRC. | a. Check and replace if necessary. b. Troubleshoot R-1331(P)/GRC (appx A). c. Troubleshoot TD-202/U (appx A). |
| 6 | Distant terminal reports high noise level. All other indications are normal. | Defective TD-202/U. | Troubleshoot TD-202/U (appx A). |
| 7 | Order wire garbled and noisy. All other indications are normal. | a. Defective TD-202/U b. Defective AN/GRC-50A(V). c. Defective CX-7872/TTC between associated TD-202/U and R-1331(P)/GRC. | a. Troubleshoot TD-202/U (appx A). b. Troubleshoot AN/GRC-50A(V) (appx A). c. Check and replace if necessary. |
| 8 | Incorrect indication on TEST ALIGN meter of TD-202/U with METER SELECT switch at TO RADIO XMTR. | a. Video level adjustment required on TD-202/U. b. Troubleshoot TD-202/U. | a. Adjust OL control on panel 5A2 or TD-202/U (para 2-15) b. Troubleshoot TD-202/U (appx A). |
| 9 | Incorrect indication on TEST ALIGN meter of TD-202/U with METER SELECT switch at FROM RADIO RCVR. Order wire noisy. | a. Video level adjustment required on TD-202/U. b. Defective TD-202/U. | a. Adjust RL control on panel 5A3 or TD-202/U (para 2-15). b. Troubleshoot TD-202/U (appx A). |

Table 5-10. Radio Repeater Troubleshooting—Continued

| Item No. | Symptom | Possible trouble | Corrective measure |
|----------|--|--|--|
| 10 | Intermittent ALARMS FRAME indication on TD-352/U (drop and insert only). | a. Defective cable from master TD-352/U to slave TD-352/U. b. Defective master or slave TD-352/U at distant terminal. | a. Check and replace if necessary. b. Request distant terminal troubleshooting. |

Table 5-11. Cable Terminal Troubleshooting

| Item No. | Symptom | Possible trouble | Corrective measure |
|----------|--|---|--|
| 1 | ALARMS FRAME indicator of TD-352/U lights, buzzer sounds, and TEST ALIGN meter indicates in green area at PCM IN and TIMING IN. | a. Defective TD-352/U. | a. Troubleshoot TD-352/U (appx A). |
| 2 | ALARMS FRAME indicator of TD-352/U lights, buzzer sounds, and TEST ALIGN meter does not indicate in green area with METER SELECT switch at PCM IN and/or TIMING IN. TD-204/U operates normally. Order wire normal. | b. Distant TD-204/U generating dummy train due to missing pcm signal input. | b. Request distant terminal or repeater troubleshooting. |
| 3 | ALARMS FRAME indicator of TD-352/U and TRAFFIC indicator of TD-204/U light, buzzer sounds, and order wire normal. | a. Defective cable between TD-352/U and TD-204/U. | a. Check and replace if necessary. |
| 4 | No order wire, but all other indications on TD-352/U and TD-204/U are normal. | b. Defective TD-204/U. | b. Troubleshoot TD-204/U (appx A). |
| 5 | ALARMS FRAME indicator of TD-352/U and ALARMS TRAFFIC indicator of TD-204/U light, buzzer sounds, and no order wire. | a. Defective pcm component at distant terminal or repeater. | a. Request distant terminal or repeater troubleshooting. |
| 6 | ALARMS FRAME indicator of TD-352/U or ALARMS NO CABLE CURRENT indicator of TD-204/U light and buzzer sounds. No order wire available. | b. Defective TD-206/G in cable link. | b. Troubleshoot cable link (para 5-5). |
| 7 | ALARMS NO CABLE CURRENT indicator on TD-204/U lights and buzzer sounds. Order wire normal. | c. Defective cable in cable link. | c. Troubleshoot cable link (para 5-5). |
| 8 | ALARMS NO CABLE CURRENT indicator of TD-204/U. No order-wire transmission. | d. Defective TD-204/U. | d. Troubleshoot TD-204/U (appx A). |
| 9 | Distant terminal indicates loss of pcm. All local indications are normal. | e. Defective TD-204/U at distant terminal or repeater. | e. Keep TD-204/U operating. Periodically try order wire, and wait response. Send person to distant terminal or repeater. |
| 10 | Switchboard operator indicates loss of a specific channel or only one way communication on a specific channel. All local indications are normal. | a. Defective TD-206/G in cable link. | a. Troubleshoot cable link (para 5-5). |
| 11 | Switchboard operator reports high noise level, distortion or hum on all channels, but all local indications are normal. | b. Defective transmission cable in cable link. | b. Troubleshoot cable link (para 5-5). |
| 12 | Order wire garbled and noisy; all other indications are normal. | c. Defective TD-204/U. | c. Troubleshoot TD-204/U (appx A). |
| 13 | No indication on TEST ALIGN meter of TD-352/U with METER SELECT switch at PCM FROM AUX (secure operations only). | d. Defective TD-204/U at distant terminal or repeater. | d. Keep TD-204/U operating. Periodically try order wire, and wait response. Send person to distant terminal or repeater. |
| | | Open transmission cable (both directions) in cable link. | Troubleshoot cable link (para 5-5). |
| | | a. Momentary overcurrent in cable | a. Operate CABLE POWER switch to OFF and then to ON. |
| | | b. Defective TD-204/U. | b. Troubleshoot TD-204/U (appx A). |
| | | Open transmission cable (send side) in cable link. | Troubleshoot cable link (para 5-5). |
| | | Defective TD-206/G in cable link. | Troubleshoot cable link (para 5-5). |
| | | a. Defective TD-352/U. | a. Troubleshoot TD-352/U (appx A). |
| | | b. Defective CV-1548/G. | b. Troubleshoot CV-1548/G (appx A). |
| | | c. Defective cable CX-7870/TCC between CV-1548/G and TD-352/U. | c. Check and replace if necessary. |
| | | d. Defective field wire in line. | d. Check and repair as required. |
| | | e. Defective TD-352/U or CV-1548/G at distant terminal. | e. Request distant terminal troubleshooting. |
| | | a. Defective TD-352/U. | a. Troubleshoot TD-352/U (appx A). |
| | | b. Defective TD-352/U at distant terminal. | b. Request distant terminal troubleshooting. |
| | | Defective TD-204/U. | Troubleshoot TD-204/U (appx A). |
| | | a. Defective cables between TSEC/KG-27 and TD-352/U. | a. Check and replace if necessary. |
| | | b. Defective TSEC/KG-27. | b. Troubleshoot TSEC/KG-27. |

Table 5-11. Cable Terminal Troubleshooting—Continued

| Item No. | Symptom | Possible trouble | Corrective measure |
|----------|--|---|--|
| 14 | All channels are noisy and all other indications are normal (secure operations only). | Defective TSEC/KG-27. | Troubleshoot TSEC/KG-27. |
| 15 | No indication on TEST ALIGN meter of slave TD-352/U with METER SELECT switch at SYNC IN (24-channel operation). | a. Defective cable between master TD-352/U and slave TD-352/U. b. Defective master TD-352/U. c. Defective slave TD-352/U. | a. Check and replace if necessary. b. Troubleshoot master TD-352/U (appx A). c. Troubleshoot slave TD-352/U (appx A). |
| 16 | Switchboard operator indicates that no signaling is available on any two-wire channel. | Defective CV-1548/G. | Troubleshoot CV-1548/G (appx A). |
| 17 | High noise level on all channels but all other indications are normal. | a. Defective TD-204/U. b. Defective TD-206/G in cable link. c. Defective TD-204/U at distant terminal or repeater. | a. Troubleshoot TD-204/U (appx A). b. Troubleshoot cable link (para 5-5). c. Request distant terminal or repeater troubleshooting. |
| 18 | Intermittent ALARMS FRAME indicator on slave TD-352/U (24-channel operation). | a. Defective cable from master TD-352/U to slave TD-352/U. b. Defective master or slave TD-352/U at distant terminal. | a. Check and replace if necessary. b. Request distant terminal troubleshooting. |
| 19 | Incorrect indication on TEST ALIGN meter of TD-204/U with METER SELECT switch at SERV FAC and SERV SEL switch at RCC. | Cable current adjustment required at distant terminal or repeater. | Request cable current adjustment at distant terminal or repeater. |
| 20 | Distant terminal or repeater requests cable current adjustment. TEST ALIGN meter of local TD-204/U does not indicate in yellow area with METER SELECT switch at CABLE I. | Cable current adjustment required. | Adjust CABLE CURRENT ADJ control for center hairline indication in yellow area of TEST ALIGN meter. |
| 21 | TEST ALIGN meter does not give correct indication with METER SELECT switch at CABLE V. | Shorted transmission cable in cable link. | Troubleshoot cable link (para 5-5). |

Table 5-12. Cable Repeater Troubleshooting

| Item No. | Symptom | Possible trouble | Corrective measure |
|----------|--|---|--|
| 1 | ALARMS TRAFFIC indicator on TD-204/U lights, buzzer sounds, and order wire is normal. | a. Defective TD-206/G cable link. b. Defective TD-204/U. | a. Troubleshoot cable link (para 5-5). b. Troubleshoot TD-204/U (appx A). |
| 2 | Distant terminal or repeater indicates loss of pcm. No indication on TEST ALIGN meter of local TD-204/U with METER SELECT switch at TIMING IN. Other TD-204/U has no alarms. | c. Defective pcm component at distant terminal or repeater. a. Defective cable between TD-204/U patch through. b. Defective video cables. NOTE In 24-channel operation, if TEST ALIGN meter of TD-204/U indicates loss of either PCM IN-1 or PCM IN-2, check associated cable. At 24-channel drop and insert repeater check associated TD-352/U. c. Other TD-204/U defective (no timing out). | c. Request distant terminal or repeater troubleshooting. a. Check and replace if necessary. b. Check and replace if necessary. c. Troubleshoot TD-204/U (appx A). |

Table 5-12. Cable Repeater Troubleshooting—Continued

| Item No. | Symptom | Possible trouble | Corrective measure |
|----------|--|--|---|
| 3 | Distant terminal indicates out of frame pcm. No indication on TEST ALIGN meter of local TD-204/U with METER SELECT switch at PCM IN-1. Other TD-204/U has no alarms. | a. Defective cable between TD-204/U's. b. Other TD-204/U defective (no pcm out). c. Defective video cable. | a. Check and replace if necessary. b. Troubleshoot TD-204/U (appx A). c. Check and replace if necessary. |
| 4 | ALARMS TRAFFIC indicator of TD-204/U lights, buzzer sounds, and no order wire. | a. Defective TD-206/G in cable link. b. Defective transmission cable in cable link. c. Defective TD-204/U. d. Defective TD-204/U at distant terminal or repeater. | a. Troubleshoot cable link (para 5-5). b. Troubleshoot cable link (para 5-5). c. Troubleshoot TD-204/U (appx A). d. Keep TD-204/U operating. Periodically try order wire and wait response. Send person to distant terminal or repeater. |
| 5 | ALARMS TRAFFIC and ALARMS NO CABLE CURRENT indicators of TD-204/U light and buzzer sounds. No order wire available. | Open transmission cable (both directions) in cable link. | Troubleshoot cable link (para 5-5). |
| 6 | ALARMS NO CABLE CURRENT indicator on TD-204/U lights and buzzer sounds. Order wire is normal. | a. Momentary overcurrent or undercurrent in cable link. b. Defective TD-204/U. | a. Operate CABLE POWER switch to OFF and then to ON. b. Troubleshoot TD-204/U (appx A). |
| 7 | ALARMS NO CABLE CURRENT indicator on TD-204/U lights. No order wire transmission. | a. Open transmission cable (send side) in cable link. b. Defective cable between TO CABLE connector of TD-204/U and PCM Transmission cable. | a. Troubleshoot cable link (para 5-5). b. Check and replace if necessary. |
| 8 | Distant terminal or repeater indicates loss of pcm. All local indications are normal. | Defective TD-206/G in cable link. | Troubleshoot cable link (para 5-5). |
| 9 | Switchboard operator at distant terminal reports high noise level, but all local indications are normal. | Defective TD-204/U. | Troubleshoot TD-204/U (appx A). |
| 10 | Order wire garbled and noisy; all other indications normal. | Defective TD-204/U. | Troubleshoot TD-204/U (appx A). |
| 11 | Through order wire communications not available, but all other indications are normal. | Defective CX-7874/TCC cable between TD-204/U's PATCH THRU connectors. | Check and replace if necessary. |
| 12 | Order wire not available; all other indications normal. | a. Defective associated TD-204/U. b. Defective distant TD-204/U. | a. Troubleshoot TD-204/U (appx A). b. Request distant terminal or repeater troubleshooting. |
| 13 | Distant terminal indicates out of frame pcm; all other indications are normal. | a. Defective TD-206/G in cable link. b. Defective TD-204/U. | a. Troubleshoot cable link (para 5-5). b. Troubleshoot TD-204/U (appx A). |
| 14 | Intermittent ALARM FRAME indication of TD-352/U (drop and insert only). | a. Defective cable from master TD-352/U to TD-204/U. b. Defective master or slave TD-352/U at distant terminal. | a. Check and replace if necessary. b. Request distant terminal troubleshooting. |
| 15 | Incorrect indication on TEST ALIGN meter of TD-204/U with METER SELECT switch at SERV FAC and SERV SEL switch at RCC. | Cable current adjustment required at distant terminal or repeater. | Request cable current adjustment at distant terminal or repeater. |
| 16 | Distant terminal or repeater requests cable current adjustment. TEST ALIGN meter of local TD-204/U does not indicate in yellow area with METER SELECT switch at CABLE 1. | Cable current adjustment required. | Adjust CABLE CURRENT ADJ control for center hairline indication in yellow area of TEST ALIGN meter of TD-204/U. |
| 17 | TEST ALIGN meter does not give correct indication with METER SELECT switch at CABLE V. | Shorted transmission cable in cable link. | Troubleshoot cable link (para 5-5). |

Table 5-13. TSEC/KG-27 Troubleshooting (TSEC/KG-27 in Alarm, Multiplexer Not in Alarm)

| Step | Action | Normal Result | Fault Symptom | Suggested Remedy |
|------|---|---|--|---|
| 1 | Attempt restart. a. Set TSEC/KG-27 ON-OFF/RESET switch to OFF/RESET, pause, then to ON. b. Verify successful alarm check by operating MONITOR select switch to ALARM position. MONITOR lamp should light if alarm check successful. | TD-352/U and TSEC/KG-27 not in alarm; system operational. Proceed to step 7. | MONITOR lamp out, TSEC/KG-27 still in alarm. | Proceed to step 2. |
| 2 | Perform detailed check of permuter tray KOK-1/TSEC; this is frequent cause of rushing noise. a. Check permuter KOK-1/TSEC to ensure it has not been zeroized and permuter tray is properly inserted. b. Check permuter tray settings. | TD-352/U and TSEC/KG-27 not in alarm; system operational. Proceed to step 7. | MONITOR lamp out, TSEC/KG-27 still in alarm. | Proceed to step 3. |
| 3 | Substitute a permuter tray KOK-1 and perform another restart as described in step 1. | Restart is successful. Proceed to step 7. | Restart is unsuccessful. | Proceed to step 4. |
| 4 | Replace both permuters trays. After carefully checking permuter settings, perform another restart as described in step 1. | Restart is successful. Proceed to step 7. | Restart is unsuccessful. | Proceed to step 5. |
| 5 | Before replacing the TSEC/KG-27, systematically substitute all cables between TSEC/KG-27 and TD-352/U except power cable. (With the TSEC/KG-27 in alarm it is assumed power is present.) NOTE The TSEC/KG-27 must be removed from the rack in order to remove cables from rear connectors. Attempt another restart as described in step 1. | Restart is successful. Proceed to step 7. | Restart is unsuccessful. | Proceed to step 6. |
| 6 | Perform loopback operation between TSEC/KG-27 and TD-352/U (para 2-11). a. Set MODE switch on TD-352/U to 12 channel operation. b. Set both permuter trays KOK-1/TSEC to the same non-zero setting. (See KAM 258()/TSEC for maintenance settings.) c. Set TD-352/U AUX IN-OUT switch to IN and POWER switch to ON. d. Attempt restart as described in step 1. | Restart is successful. Proceed to step 7. | Restart is not successful. | Replace the cable as described in step 5 and attempt another loopback operation: If the TSEC/KG-27 is still in alarm, replace TSEC/KG-27. Send defective unit to a higher category of maintenance for repair. |
| 7 | Alert operator at remote terminal. Restore TSEC/KG-27 to normal operating configuration; the TSEC/KG-27 is now operational. | NA | NA | NA |

Table 5-14. TSEC/KG-27 Troubleshooting (TSEC/KG-27 Not in Alarm, Multiplexer in Alarm)

| Step | Action | Normal result | Fault symptom | Suggested remedy |
|------|---|--|---------------------------------------|---|
| 1 | Contact opposite station (remote terminal). Inquire if opposite is transmitting. | Opposite station is transmitting. Proceed to step 2. | Opposite station is not transmitting. | Await notification that opposite station is ready to transmit. |
| 2 | Contact personnel maintaining adjacent equipment. Fault is probably in adjacent equipment at this, the local station. | NA | NA | NA |
| 3 | Observe if TD-352/U is in alarm. | TD-352/U and TSEC/KG-27 not in alarm. Proceed to step 4. | TD-352/U in alarm. | Systematically substitute all cables and attempt loopback operation. If TD-352/U is still in alarm, replace defective unit. Send defective unit to a higher category of maintenance for repair. |
| 4 | Alert opposite station operator. Restore TSEC/KG-27 to normal operating configuration; TSEC/KG-27 is now operational. | NA | NA | NA |

Table 5-15. TSEC/KG-27 Troubleshooting (TSEC/KG-27 and Multiplexer Not in Alarm. Fault Indication by Verbal Contact)

| Step | Action | Normal result | Fault symptom | Suggested remedy |
|------|---|--|--|---|
| 1 | Local switchboard operator reports all local receive audio channels are dead or have only noise, or opposite station operator reports opposite multiplexer is in alarm. (If TSEC/KG-27 power problems are suspected, perform power monitoring procedure in step 8 below before continuing.) | NA | NA | If fault indication is from local switchboard operator, proceed to step 2. If fault indication is from opposite station operator, proceed to step 8. |
| 2 | Contact opposite station; request test tone on each of 12 channels. Record results. Clicks, buzzing or a rushing sound on all channels may be indications of a defective TSEC/KG-27. Other tone quality deficiencies such as excessive hum on some but not all channels indicates a defective TD-352/U. | NA | Tone quality deficiencies suggest malfunctioning TSEC/KG-27. | Proceed to step 3. |
| 3 | Observe the following TSEC/KG-27 receive conditions: a. REC TIM. b. REC PCM. c. REC FRAME. | MONITOR lamp lights in all selector switch positions. Proceed to step 4. | MONITOR lamp out in one or all selector switch positions. | Replace cable carrying particular signal. Each time cable is replaced verify that MONITOR lamp lights for the MONITOR selects switch position. If the MONITOR lamp remains out. Perform loopback operation to determine defective unit. |
| 4 | Monitor TD-352/U PCM FROM AUX signal at TD-352/U (REC PCM OUT from TSEC/KG-27). | PCM FROM AUX signal present and trouble corrected. Proceed to step 7. | PCM FROM AUX signal not present. | Proceed to step 5. |

Table 5-15. TSEC/KG-27 Troubleshooting (TSEC/KG-27 and Multiplexer Not in Alarm. Fault Indication by Verbal Contact)—Cont.

| Step | Action | Normal result | Fault symptom | Suggested remedy |
|------|---|--|---|---|
| 5 | Recable TSEC/KG-27 for loop back operation as described in paragraph 2-11. Attempt a restart. | Restart successful. Proceed to step 6. | Restart not successful. | Try a replacement TSEC/KG-27. If a successful restart is still not possible, contact personnel maintaining adjacent equipment; there may be a malfunction on the adjacent equipment operating with the TSEC/KG-27 and TD-352/U. |
| 6 | Monitor all 12 audio channels with a test tone. | Test tone is satisfactory on all channels. Proceed to step 7. | Test tone not satisfactory. | Contact personnel maintaining adjacent equipment; there may be a malfunction in the adjacent equipment operating with the TSEC/KG-27 and TD-352/U. |
| 7 | Alert opposite station operator. Restore TSEC/KG-27 to normal operational configuration; TSEC/KG-27 is now operational. | System operational. | System not operational. | Proceed to step 8. |
| 8 | The previous seven steps have attempted to isolate a malfunction in the receive portion of the TSEC/KG-27 based on local operator complaints. At this point, check TSEC/KG-27 power and transmit functions because of remote operator complaints. Observe the following power monitoring conditions: a. 4 VB. b. 12V. c. -6V. d. 4VR. e. -10V. | MONITOR lamp lights in all positions. Proceed to step 9. | MONITOR lamp out in all positions. | Replace power cable. Observe that POWER indicator lamp lights. Observe power monitoring conditions again. If MONITOR lamp does not light in some positions of the selector switch, replace the TSEC/KG-27. |
| 9 | Observe the TSEC/KG-27 XMIT signal monitoring conditions: a. XMIT TIM. b. XMIT PCM. c. XMIT FRAME. | MONITOR lamp lights for all positions. Proceed to step 10. | MONITOR lamp out in one or more positions. | Replace appropriate cable carrying the signal. Observe MONITOR lamp lights. Perform loopback operation to determine defective unit. Send defective unit to a higher category of maintenance for repair. |
| 10 | Obtain assistance from personnel maintaining adjacent equipment so as to evaluate TSEC/KG-27 inputs to adjacent equipments operating with the TSEC/KG-27 and TD-352/U. | Correct indications on adjacent equipment. Proceed to step 11. | Incorrect TSEC/KG-27 inputs to adjacent equipments. | Replace TSEC/KG-27. Send defective unit to higher category maintenance for repair. |
| 11 | Recable TSEC/KG-27 for loopback operation as described in a paragraph 2-11 and attempt a restart. | Restart successful. Proceed to step 12. | Restart not successful. | Replace TSEC/KG-27. Send defective unit to a higher category maintenance for repair. |
| 12 | Alert opposite station operator. Restore TSEC/KG-27 to normal operational configuration. TSEC/KG-27 is operational. | | | |

NOTE

If after completing the troubleshooting procedures a TSEC/KG-27 is still not operating satisfactorily, contact higher category maintenance personnel for assistance.

b. Loopback Checks. Output circuits of the pcm components may be looped back to the input circuits to verify isolation of troubles in a system. The loopback checks are performed as part of the preinstallation checks in paragraph 2-15. Refer to the loopback check for the system application in paragraph 2-15 and check the component by operating the METER SELECT switch through its positions and observing the various indications. When the loopback checks are complete reconnect the cables for the system requirements. System loopback checks can not be done in the secure mode.

NOTE

PCM circuits are full duplex which can cause a transmit problem to appear to be in the receive circuit during the loopback check.

5-5. Cable Link Troubleshooting

NOTE

Before troubleshooting convert assemblage to nonsecure mode. If trouble persists, perform the procedures in *a*, *b*, and *c* below. If trouble clears, replace TSEC/KG-27 and/or interconnecting cables and continue normal operations.

a. Order Wire Available with No Pcm or Shorted Transmission Cable.

- (1) Disconnect cable from the PCM IN-1 connector of the TD-204/U.
- (2) Operate the METER SELECT switch of the TD-204/U to SERV FAC.
- (3) Loosen the front panel screws on the TD-204/U, press the PUSH TO RELEASE CHASSIS button, and pull the front panel forward.
- (4) Operate the SERV SEL switch of the TD-204/U to R.
- (5) Operate the NORM OPR-ZERO SET-READ switch of the TD-204/U to ZERO SET.
- (6) Adjust the ZERO SET control for a center hairline indication on the TEST ALIGN meter.
- (7) Operate the NORM OPR-ZERO SET-READ switch of the TD-204/U to READ.
- (8) Operate the SYSTEM FAULT LOCATOR MILES switch of the TD-204/U for a center hairline indication on the TEST ALIGN meter (as close as possible).
- (9) From the positions of the SYSTEM FAULT LOCATOR MILES switches, determine the number of good TD-206/G's between the TD-204/U and the defective cable section or TD-206/G.
- (10) Operate the SYSTEM FAULT LOCATOR MILES switches of the TD-204/U to O and the NORM OPR-ZERO SET-READ switch to NORM OPR.

(11) Slide the front panel of the TD-204/U back until it locks into place and tighten the front panel screws.

(12) Operate the CABLE POWER switch of the TD-204/U at each end of the cable link to OFF.

(13) Send a lineperson out to troubleshoot with the AN/PTM-7.

WARNING

Do not operate the CABLE POWER switch of the TD-204/U to ON at either end of the cable link unless requested by the lineperson. If the CABLE POWER or CABLE CURRENT switch is operated to ON, voltages as high as 1,000 volts may be present in the transmission cable.

(14) Coordinate with the lineperson to troubleshoot and make the necessary replacements (cable section or TD-206/G).

b. Order Wire Available with Pcm Out of Frame or Noise on All Channels.

- (1) Operate the CABLE POWER switch of the TD-204/U at each end of the cable link to OFF.
- (2) Send a lineperson out to the TD-206/G at the midpoint in the cable link with the AN/PTM-7, and give instructions to connect into the cable link.
- (3) When order wire is established with the lineperson, give instructions to perform the loopback check with the AN/PTM-7. Remember that looping back a cable doubles the distance. Make appropriate settings on MILE switches.

WARNING

Do not operate the CABLE POWER switch of the TD-204/U to ON at either end of the cable link unless requested by the lineperson. If the CABLE POWER or CABLE CURRENT switch is operated to ON, voltages as high as 1,000 volts may be present in the transmission cable.

(4) Operate the CABLE POWER or CABLE CURRENT switch to ON at both ends of the cable link, and check to see which end of the cable link has a FRAME ALARM indicator lighted on the TD-351/U for the associated terminal or noise on all channels.

(5) When the indications are obtained, operate the CABLE POWER switch on the TD-204/U at each end of the link to OFF.

(6) Instruct the lineperson to substitute another TD-206/G in the cable link. When the substitution is complete, operate the CABLE POWER or CABLE CURRENT switches to ON and check to see if the trouble still exists.

(7) If the trouble is not corrected, instruct the lineperson to replace the original TD-206/G in the

cable link and proceed to a TD-206/G halfway between the lineperson's position and the end of the cable link that reported a frame alarm or noise on all channels during the first loopback check ((4) above).

(8) Perform the procedures given in (3) through (6) above at the next TD-206/G. If the trouble is not corrected, instruct the lineperson to replace the original TD-206/G and continue the troubleshooting procedure until the defective TD-206/G is located.

c. No Order Wire or Pcm Available.

NOTE

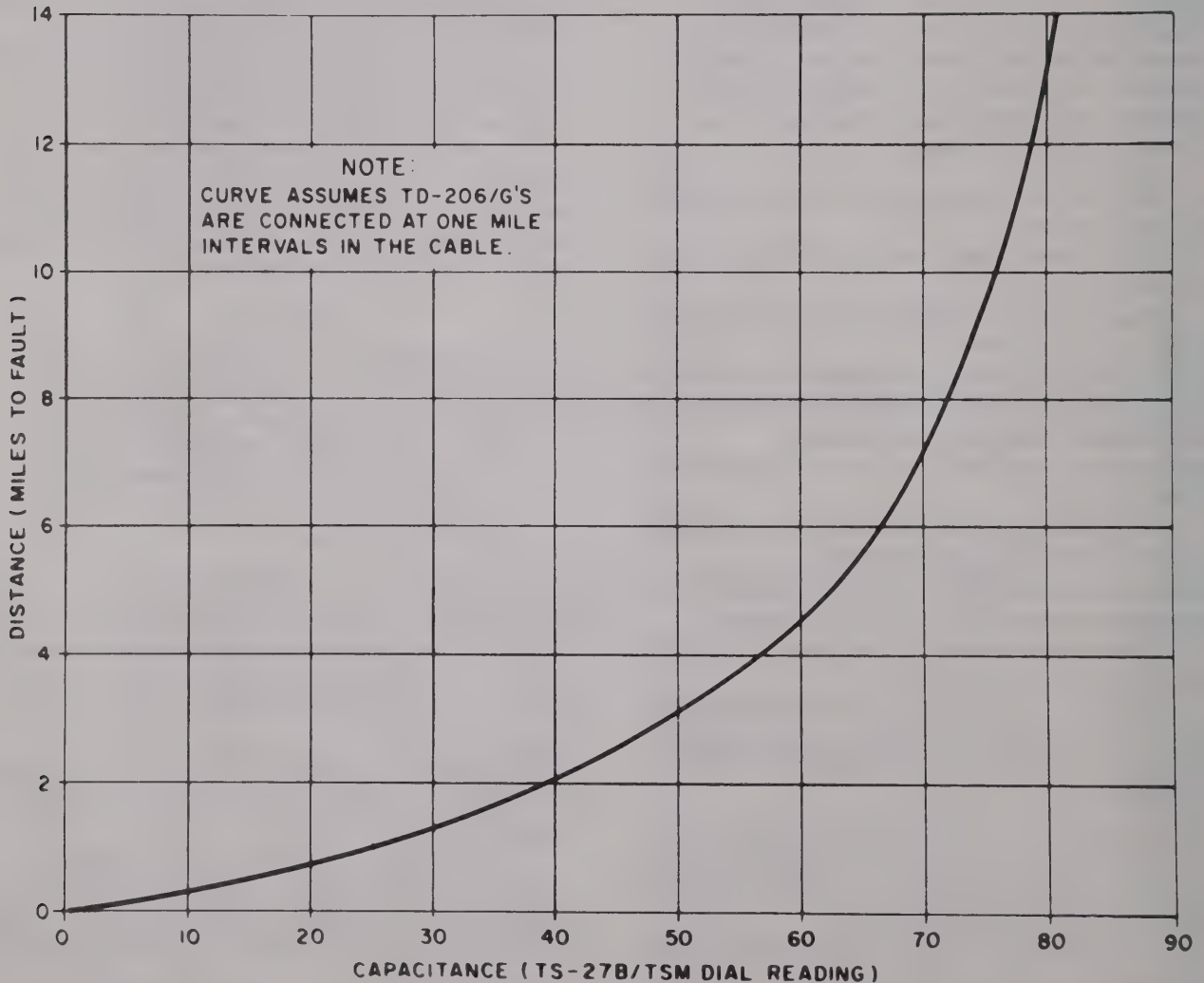
If the ALARMS NO CABLE CURRENT indicator of the TD-204/U remains extinguished after the CABLE POWER or CABLE CURRENT switch is operated to OFF and then to ON, the transmission cable is shorted. Perform the procedures

given in *a* above to locate the shorted cable section. When the ALARMS NO CABLE CURRENT indicator of the TD-204/U immediately lights after the switch is operated to OFF and then to ON, THE TRANSMISSION CABLE IS OPEN. Perform the procedures given in (1) through (5) below to locate the defective cable section.

(1) Operate the CABLE POWER switch of the TD-204/U to OFF.

(2) Disconnect the cable from the TO CABLE connector of the TD-204/U and connect it to Test Set TS-27B/TSM.

(3) Measure the capacitance of the cable with the TS-27B/TSM, and translate the indications into the distance to the fault (fig. 5-1).



EL3TT053

Figure 5-1. Test Set TS-27B/TSM, CX-4245/G or CX-11230/G transmission cable capacitance-distance curve.

(4) If the indicated distance exceeds 10 miles, send a lineperson out to the 10-mile point to repeat the measurement.

(5) Instruct the lineperson to use the AN/PTM-7 at the cable connection nearest the fault to locate the distance to the fault.

NOTE

When the fault is located in a section of the cable link where two cable sections join, use the AN/PTM-7 order wire facility to determine which cable section is at fault.

5-6. Assemblage Troubleshooting

NOTE

Before troubleshooting convert assemblage to nonsecure mode. If trouble persists, perform the troubleshooting procedures in table 5-16. If trouble clears,

replace the TSEC/KG-27 and/or interconnecting cables and continue normal operations.

Replace and repair of components and parts for the AN/TRC-117(*) are authorized for the various categories of maintenance personnel as indicated in section II of the maintenance allocation chart (appx C). The tools and test equipment required are listed in section III of the maintenance allocation chart. The troubleshooting information in table 5-16 is based on symptoms that would be obtained while performing the operator's daily preventive maintenance checks and services (table 4-1) and organizational monthly preventive maintenance checks and services (table 5-1). When an abnormal symptom is obtained, locate the symptom in the troubleshooting table and perform the corrective measure indicated, as authorized in the maintenance allocation chart. If the corrective measure does not correct the trouble, replace the component and refer the defective component to higher category maintenance.

Table 5-16. Assemblage Troubleshooting

| Item No. | Symptom | Possible trouble | Corrective measure |
|----------|---|---|---|
| 1 | POWER INDICATOR neon light fails to glow when power is applied to assemblage. | a. Defective lamp. b. Defective power cable. c. Defective POWER 115V AC IN receptacle. NOTE If immediate operation is required, and POWER 115V OUT receptacle is not used to power another assemblage, use POWER 115V AC OUT receptacle for input power. | a. Replace lamp. b. Check and repair or replace as required. c. Replace receptacle. |
| 2 | VOLTS A.C. meter indicates 0 volt when power is applied to assemblage and MAIN circuit breaker is operated to ON. | a. Defective MAIN circuit breaker. b. Defective VOLTS A.C. meter. | a. Replace circuit breaker. b. Replace meter. |
| 3 | Glowlamp fails to glow when associated circuit breaker is operated to ON. | a. Defective glowlamp. b. Defective circuit breaker. | a. Replace glowlamp. b. Replace circuit breaker. |
| 4 | Fluorescent ceiling lights do not operate when FLUORESCENT LIGHTS switch is operated to ON. | a. Defective BYPASS BLACKOUT switch. b. Defective LIGHTS circuit breaker on POWER DISTRIBUTION PANEL. | a. Replace switch. b. Replace circuit breaker. |
| 5 | Incandescent ceiling lamps do not light when INCANDESCENT COLD START LIGHTS switch is operated to ON. | a. Defective INCANDESCENT COLD START LIGHTS switch. b. Defective fixture or wiring. | a. Replace switch. b. Check and repair or replace as required. |
| 6 | Ceiling lights are not extinguished when door is opened and BYPASS BLACKOUT switch is at BLACKOUT. | a. Defective door microswitch. b. Defective BYPASS BLACKOUT switch. | a. Replace switch. b. Replace switch. |

Table 5-16. Assemblage Troubleshooting—Continued

| Item No. | Symptom | Possible trouble | Corrective measure |
|----------|--|---|--|
| 7 | Exhaust blower fails to operate when BLOWER switch is operated to ON. | a. Defective exhaust blower. b. Defective BLOWER switch or receptacle. | a. Check and repair or replace as required. b. Check and replace as required. |
| 8 | Both exhaust blowers fail to operate when BLOWER switches are operated to ON. | a. Defective BLOWERS circuit breaker. b. Defective ac wiring. | a. Check and replace as required. b. Check and repair as required. |
| 9 | Heater fails to operate properly. | a. Defective HEATER receptacle. b. Defective heater. c. Defective HEATER circuit breaker. d. Defective ac wiring. | a. Check and replace as required. b. Check and repair as required. c. Check and replace as required. d. Check and repair as required. |
| 10 | CN-514/GRC POWER indicator does not light when POWER circuit breaker is operated to ON. | a. Defective power cable to CN-514/GRC. b. Defective VOLT REG circuit breaker on POWER DISTRIBUTION PANEL. c. Defective CN-514/GRC. | a. Check and repair or replace as required. b. Replace circuit breaker. c. Check and repair or replace as required. |
| 11 | No ac power available from any CONVENIENCE receptacle. | Defective CONV circuit breaker on POWER DISTRIBUTION PANEL. | Replace circuit breaker. |
| 12 | Power indicator on overvoltage protection device does not light when POWER switch is operated to ON. | a. Defective power cable between CN-514/GRC and overvoltage protection device. b. Defective overvoltage protection device. c. Defective CN-514/GRC. | a. Check and repair or replace as required. b. Check and repair or replace as required. c. Check and repair or replace as required. |
| 13 | No rack equipment operates with SYSTEM 1 and SYSTEM 2 circuit breakers, CN-514/GRC, and overvoltage protection device operating. | a. Defective circuit breaker. b. Defective overvoltage protection device. c. Defective ac wiring. | a. Check and repair or replace as required. b. Check and repair or replace as required. c. Check and repair or replace as required. |
| 14 | Local communications not available with LS-147C/FI. | a. Defective LS-147C/FI. b. Defective wiring. | a. Check and repair or replace as required. b. Check and repair or replace as required. |
| 15 | Local communication not available with TA-312/PT. | a. Defective TA-312/PT. b. Defective wiring. | a. Check and repair or replace as required. b. Check and repair or replace as required. |

Section III. ORGANIZATIONAL REPAIR PROCEDURES

5-7. Component Removal and Replacement

a. Removal.

- (1) Operate the component AC POWER switch to OFF.
- (2) Disconnect the component power cord from the associated power receptacle.
- (3) Note, and disconnect all cables, cords, and leads from the component.
- (4) Remove the screws that secure the component to the equipment rack.
- (5) Slide the component forward, out of the rack, and place it on the floor of the assemblage.

(6) If the component is to be replaced with another component, remove the screws that secure the mounting brackets to the sides of the component, and remove the brackets.

(7) If the component is to be shipped or taken to another location, replace the cover and case associated with it.

b. Replacement.

(1) Mount the brackets removed from the original component (a(6) above) to the replacement component.

(2) Slide the replacement component into position in the rack.

(3) Fasten the mounting brackets on the component to the equipment rack with the screws removed in a(4) above.

(4) If the replacement component is supplied with a cover, remove it.

(5) Connect the cables, cords, and leads removed from the original component to the replacement component.

(6) Turn on the component in accordance with the applicable procedures in chapter 3 and perform the applicable daily preventive maintenance procedures in paragraph 4-3 and the component technical manual (appx A).

5-8. Electric Heater Repairs

a. Remove the heater from its mounting base and remove the cover plates to provide access to the interior of the heater.

b. Refer to the heater instruction plates for circuit details and identification of heater parts. Replace defective parts as authorized.

5-9. Exhaust Blower Repairs

(fig. 5-2)

Organizational repair of blowers is restricted to replacement of ac power cords and the blower motor and impeller.

a. Operate the appropriate BLOWER switch to OFF.

b. Remove the defective power cord, blower motor or impeller.

c. Refer to figure 5-2 to determine the correct connections for the required motor rotation and the required position of the impeller. Be sure that the concave portion of the impeller faces the airflow hole as indicated.

NOTE

If the replacement motor is provided with two mounting sides, install the motor so the capacitor side is facing the front wall.

5-10. POWER DISTRIBUTION PANEL Repairs

(Fig. 5-3)

WARNING

Before performing any POWER DISTRIBUTION PANEL repairs, disconnect the power cable from the POWER 115V AC IN receptacle in the POWER & SIGNAL ENTRANCE BOX.

a. *Preliminary Procedures.* Remove the screws that secure the cover to the POWER DISTRIBUTION PANEL and remove the cover.

b. *Removal and Replacement of Circuit Breaker.*

(1) Grasp the defective circuit breaker and pull it straight out from the panel.

(2) Disconnect the wires connected to the circuit breaker.

(3) Connect the wires to the appropriate terminals of the replacement circuit breakers.

(4) Position the circuit breaker in the POWER DISTRIBUTION PANEL and firmly press it in place.

c. *Removal and Replacement of Current Transformer.*

(1) Note and disconnect the black and white leads from the transformer terminals.

(2) Remove the nuts and washers that secure the current transformer inside the panel, and remove the current transformer.

NOTE

Count the number of turns of heavy black wire through the center hole of the current transformer before proceeding to the next step.

(3) Disconnect the black wire wound around the current transformer from the MAIN circuit breaker and carefully unwind the wire.

CAUTION

Be sure that the number of turns around the replacement current transformer is the same as that on the original transformer.

(4) Wind the black wire around the replacement current transformer.

(5) Reconnect the black wire to the MAIN circuit breaker.

(6) Position the current transformer inside the panel and secure it with the original nuts and washer.

(7) Connect the black and white ammeter leads to the appropriate terminals of the transformer.

d. *Removal and Replacement of Meters.*

(1) Note the color connections and remove the leads from the meter terminals.

(2) Remove the bolts that secure the meter to the panel and lift the meter out.

(3) Position the replacement meter in the panel and secure it with the original bolts.

(4) Connect the leads to the appropriate terminal of the replacement meter.

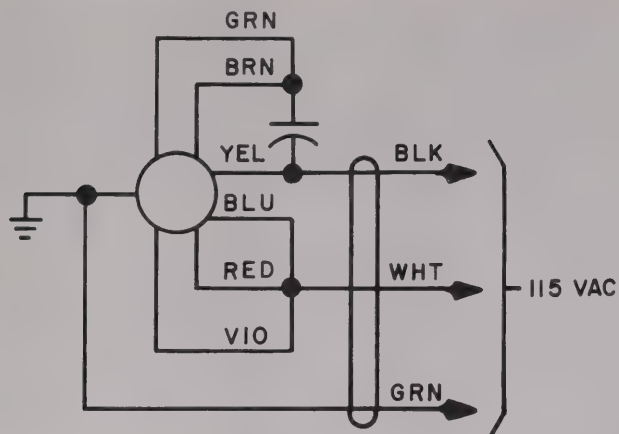
5-11. Switch Replacement

a. Ensure proper circuit breaker is operated to OFF.

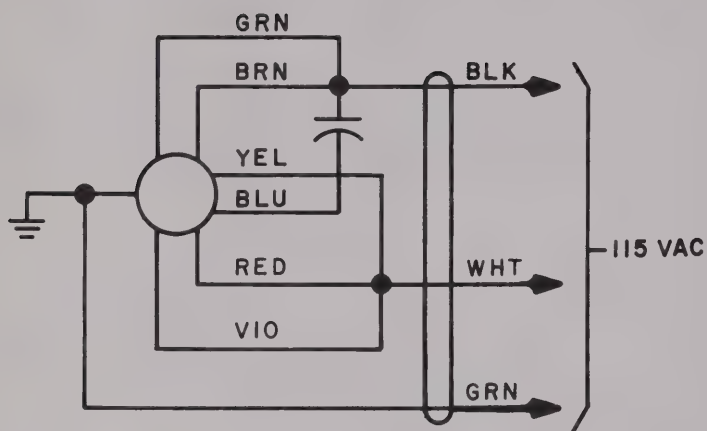
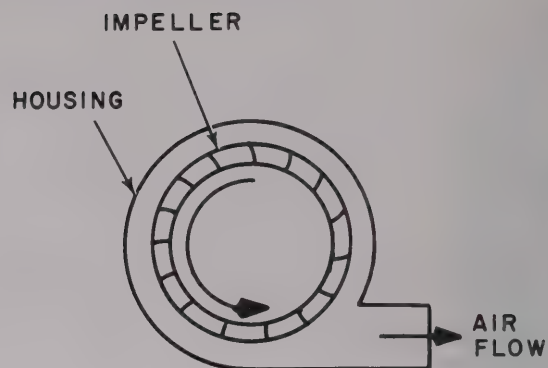
b. Remove access plate from power duct and withdraw switch. Be sure to save mounting screws.

c. Remove wires from switch terminals, remembering the color of the wire at each terminal.

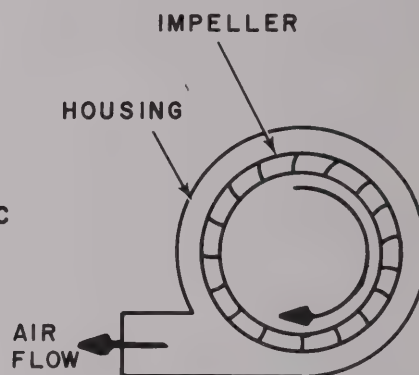
d. Install new switch by connecting appropriate wires and tightening all screws securely.



A. ROADSIDE (COUNTERCLOCKWISE).



B. CURBSIDE (CLOCKWISE).



NOTE:

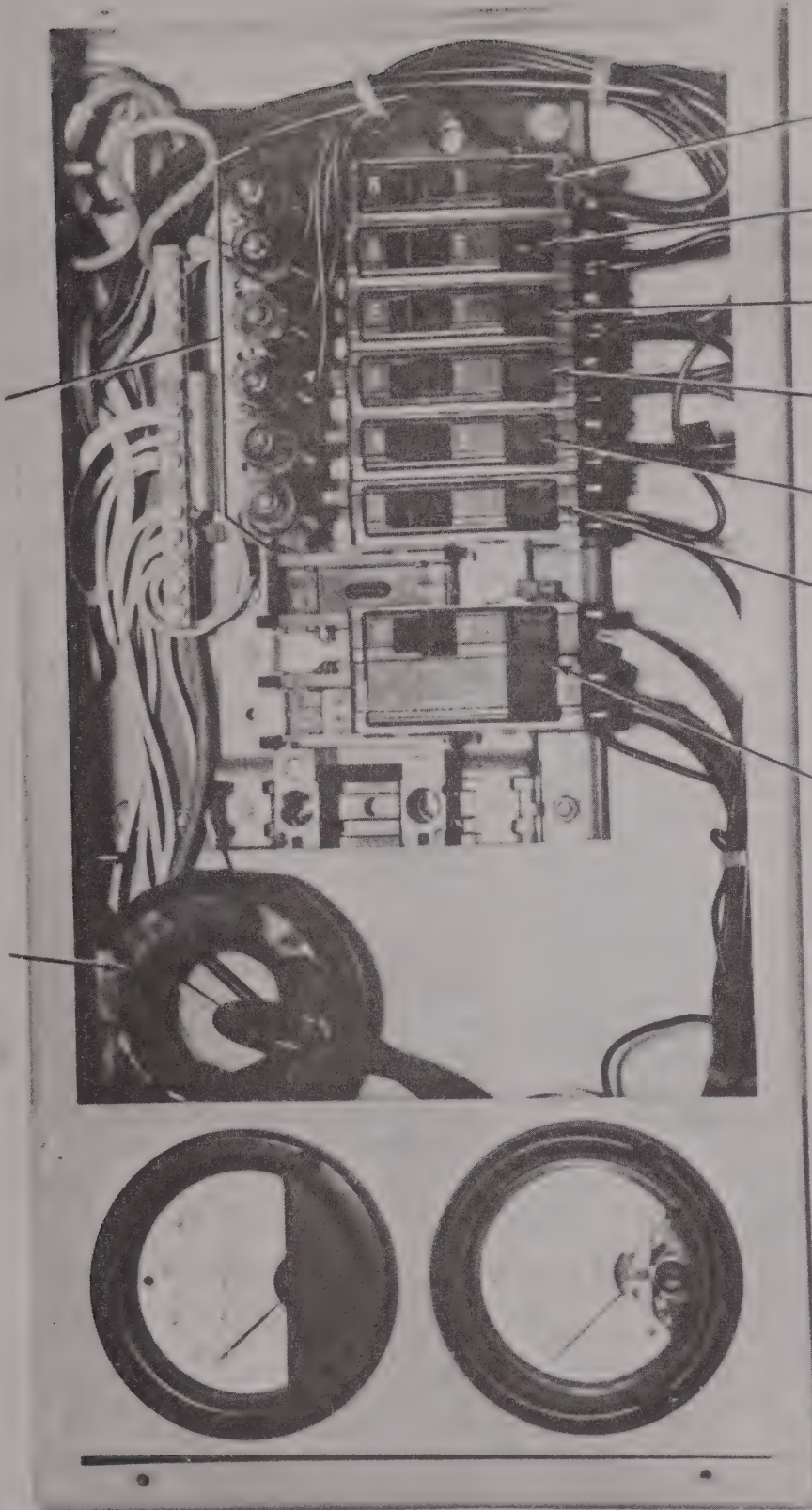
DIRECTION OF ROTATION IS VIEWED FROM
MOTOR END OPPOSITE SHAFT.

EL3TT054

Figure 5-2. Blower motor connections and impeller installation diagram.

INDICATORS
1 THRU 6

TRANSFORMER
T1



MAIN
CIRCUIT
BREAKER

CB1 CB2 CB3 CB4 CB5 CB6

EL3TT055

Figure 5-3. POWER DISTRIBUTION PANEL, interior details.

CHAPTER 6

FUNCTIONING OF EQUIPMENT

6-1. General

a. The AN/TRC-117(*) is a versatile communications facility capable of repeater or terminal application as discussed in chapter 2. These systems use radio or cable or combinations of both as a transmission medium.

b. As a 12- or 24- channel pcm radio terminal, the signal is received through the antenna system and passed from the radio receiver to the TD-202/U where the signal is processed for cable transmission.

c. For cable-to-radio transmission, the signal is processed through the TD-202/U and passed to the transmitter for radio transmission.

6-2. Principles of Multiplexing

a. Multiplexing is a technique used to simultaneously transmit several channels of voice or data over a radio or cable link. The frequency division multiplexer (fdm) equipment uses a subcarrier frequency for each voice or data channel. In time division multiplexer (tdm) equipment, each voice or channel shares the transmission time and is intermittently transmitted.

b. In time division multiplexing, each voice channel is assigned a time interval in sequence with all other channels being multiplexed. These intervals are short and repeated at a high frequency. The samples taken from each channel are then converted to a form suitable for transmission in the selected medium. At the receiving terminal, the samples are demodulated and separated into their proper channels by a timing signal from the transmitting terminal.

6-3. Pulse Code Modulation

a. Pulse code modulation (pcm) is a communication technique in which voice, data, or facsimile signals are converted into a series of digital pulse codes. Each pulse code represents signal amplitude at a particular instant and a series of pulse codes represents a complete waveform. Since the transmitted signal is in digital form, it is less susceptible to noise and distortion buildup over long distance lines, and may be regenerated at repeaters along

the route without introducing additional distortion.

b. In the pcm process, standard amplitude levels are assigned and are represented by digital codes. The incoming voice waveform is sampled at a high rate, and each sample is converted to a pulse at the close of standard amplitude, producing a pulse amplitude modulated (pam) waveform. The standard amplitude pulses developed are then measured and converted to a binary pulse code (pcm) for transmission. The pulse codes are decoded at the receiving station and reconverted to a pam waveform, which is then demodulated to produce approximately the original waveform. As the sampling frequency is increased, the waveform generated at the receiver more accurately resembles the original waveform.

6-4. AN/TRC-117(*) Equipment

a. Converter, Telephone Signal CV-1548/G provides telephone signal conversion and hybrid facilities for 12 multiplex channels. Each channel contains one-way supervision and ringdown signaling conversion facilities, a hybrid for converting between 2-wire and 4-wire circuits, 4 wire straight-through patching, and switching for selecting combinations of these functions.

b. Multiplexer TD-204/U is a 12, 24 or 48 channel pcm cable transmission interface unit. Its transmit section accepts tdm-pcm output signal from one or two TD-352/U's or from another TD-204/U and processes these signals for cable transmission. The receive section accepts a pcm signal from the transmission cable and processes and retimes it. In addition, the TD-204/U provides for up to 39 TD-206/G's in the transmission cable, and contains an order wire facility.

c. Multiplexer TD-202/U is a 12- or 24-channel pcm radio transmission interface unit. Its transmit section accepts time division multiplex (tdm) pcm outputs from one or two TD-352/U's, a TD-204/U or from another TD-202/U and processes these outputs for radio transmission. The receive section accepts a pcm signal from the R-1331(P)/GRC, processes and retimes it and extracts the order wire signal.

d. Multiplexer TD-352/U converts 12 four-wire

voice-frequency (vf) channels to a tdm-pcm signal in its transmit section, and vice versa in its receive section.

e. Voltage Regulator CN-514/GRC provides a regulated voltage to the pcm components.

f. Power Supply PP-2054/GRC provides a regulated power supply to the transmitter components of the assemblage.

g. Electronic Key Generator TSEC/KG-27 is required for secure operations.

CHAPTER 7

DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE

7-1. Scope of DS and GS Maintenance

a. General. Direct and general support maintenance consists entirely of corrective maintenance procedures as indicated in the maintenance allocation chart (appx D).

b. Tools and Test Equipment Required. The tools and test equipment required for direct and general support maintenance of the AN/TRC-117(*) are listed in section II of the maintenance allocation chart (appx D).

7-2. Direct Support Repair Procedures

a. Communications Equipment Repair. Refer to the applicable technical manual (appx A) for instructions in performing direct support maintenance of the AN/GRC-50A(V), TD-202/U, TD-204/U, TD-352/U, CV-1548/G, LS-247C/FI, CN-514/GRC, TSEC/KG-27, and TA-312/PT.

b. Shelter, Electrical Equipment S-330()/TRC-117(*) Repairs.* Direct support repair of the S-330(*)/TRC-117(*) includes the following:

(1) Emergency repairs of holes and minor structural damage to the shelter facility.

(2) Removal and replacement of the door handle and latchbolt assemblies, entrance door filter and cover assemblies and gaskets for the blower vents and the entrance boxes.

c. Overvoltage Protection Device (fig. 7-1 and 7-2). Remove the cover from the overvoltage protection device, and then perform the required troubleshooting and repair procedures.

d. Power Receptacle Replacement.

(1) Disconnect the power cable from the POWER 115V AC IN receptacle in the POWER & SIGNAL ENTRANCE BOX.

(2) Remove the interior cover of the POWER & SIGNAL ENTRANCE BOX, disconnect the wires from the appropriate receptacle, and remove the receptacle.

(3) Install the replacement receptacle, connect the wires to the proper terminals of the receptacle, and replace the cover on the POWER & SIGNAL ENTRANCE BOX.

e. Antenna and Video Cable Receptacles Replacement.

(1) Remove the interior cover for the ANTEN-

NA & VIDEO ENTRANCE BOX, disconnect the receptacle to be replaced and remove the receptacle.

(2) Install the replacement connector and connect it. Replace the interior cover on the ANTENNA & VIDEO ENTRANCE BOX.

f. Power Cable Connectors. Refer to figures 7-3 and 7-4 for details of removal and replacement procedures.

g. Twinax Rf Cable Repair. Refer to figure FO-5 or assembly details of Twinax cable, a part of the TSEC/KG-27 installation kit.

(1) *UG-260D connector assembly.*

(a) Slide nut onto cable. Cut jacket 1/2 inch from end of cable.

(b) Comb braid back to cut fillers and strip clear conductor insulation 1/2 inch from end of cable.

(c) Comb stripped conductor and braid together.

(d) Cut off inner insulation and wire under braid 3/8 inch from end of jacket.

(e) Taper braid. Slide washer, gasket and sleeve over tapered braid. Fit inner shoulder of sleeve squarely against end of cable jacket.

(f) With sleeve in place, comb cut braid, fold back smooth and trim to 3/32 inch from end. Cut inner dielectric 1/8 inch from braid being careful not to nick inner connector and cut off inner conductor 1/8 inch from end of dielectric.

(g) Tin inside hole of contact, tin center conductor of cable, slip contact in place and solder. Be sure cable dielectric is not heated excessively and swollen so as to prevent dielectric entering body.

(h) Push assembly into body as far as it will go, then slide nut into body and screw into place with wrench until it is moderately tight. Hold cable and shell rigidly and rotate nut.

(2) *PL-75 connector assembly.*

(a) Slip back clamping nut over cable. Strip outer jacket and shield 5/8 inch from end of cable.

(b) Strip 1/4 inch dielectric from one of two wires, then strip dielectric 3/8 inch from end of second conductor and tin leaving 1/4 inch of dielectric from end of outer jacket.

(c) Slip cone assembly over two conductors and insert under outer braid and jacket until outer

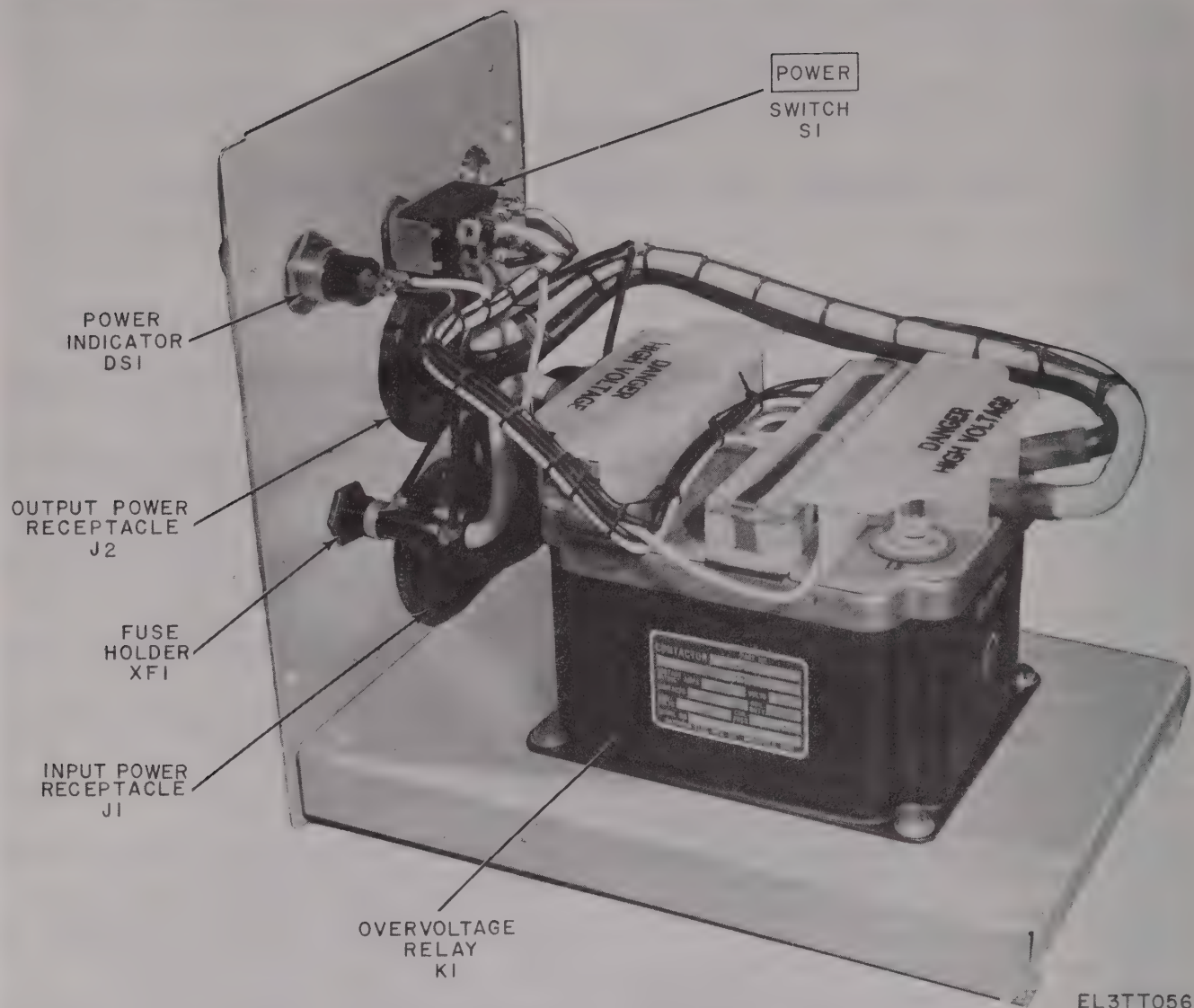


Figure 7-1. Overvoltage protection device, parts location.

jacket is up to shoulder on cone. Place nylon washer on cable and against cone assembly. Place teflon insulator sleeve over insulation allowing longer stripped wire to extend from slot provided. Place nylon washer on center conductor then pin on center conductor and solder.

(d) Place forward insulator over center pin. Place ring finger over assembly until flush with cone assembly, then bring out lead formed in (c) above through the slot of ring finger, trim to length and neatly solder.

(e) Place outer teflon insulator over assembly flush with cone. Place connector body over entire assembly. Slide nut back up and tighten unit by rotating body only. Keep nut fixed to one position.

7-3. General Support Repair Procedures

a. *Communications Equipment Repair.* Refer to the applicable technical manual (appx A) for instructions on performing general support maintenance on the communications equipment in the assemblage.

b. *Shelter, Electrical Equipment S-330(*)/TRC-117(*) Repair.* General support maintenance of the S-330(*)/TRC-117(*) includes replacement of doors and skids, and permanent repair of holes and major structural damage to the shelter. Refer to TB 43-0124 for further information on general support maintenance of the shelter facility.

c. *Removal of 26-Pair Receptacle* (fig. 7-5).

(1) Remove the screws that secure the cover to the rear of the SIGNAL ENTRANCE BOX.

(2) Remove the cover from the defective 26-pair receptacle.

(3) Remove the mounting screws that secure the insert clip to the housing.

(4) Unfasten the cable clip that secures the cable form.

(5) Lift the receptacle insert out of the housing; tag and unsolder the wires.

(6) Remove the mounting screws and remove the housing.

d. *Replacement of the 26-pair Receptacle* (fig. 7-5).

(1) Position the housing and secure it to the SIGNAL ENTRANCE BOX.

CAUTION

Be extremely careful when connecting and soldering wires to the receptacle insert. Excessive heat or pressure will damage the receptacle insert.

(2) Slide the end of the cable form out through the housing and connect the wires to the receptacle insert.

CAUTION

Be careful not to damage the wires when replacing the receptacle insert mounting screws.

(3) Position the receptacle insert and insert slips in the housing; secure the insert clips with the mounting screws.

(4) Secure the cable form by fastening the cable clip.

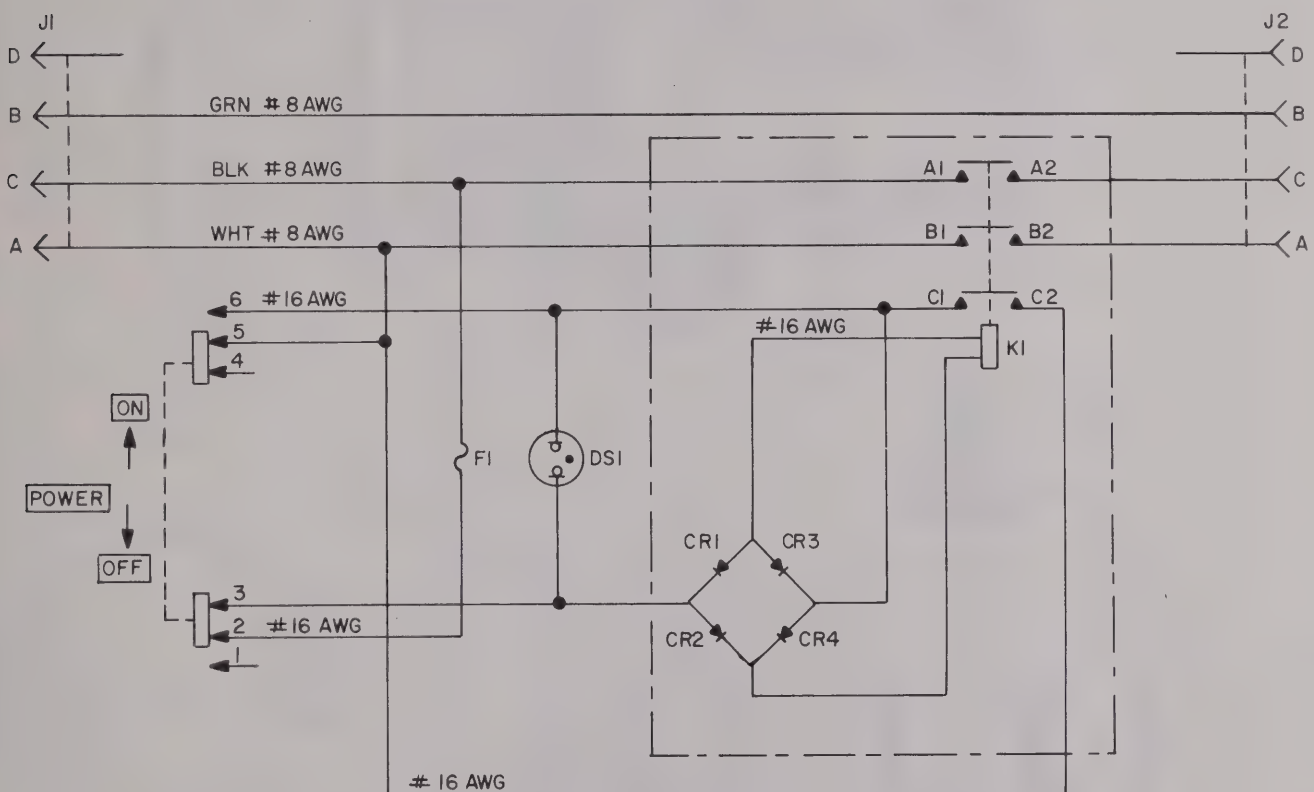
(5) Install the cover on the housing.

(6) Position and secure the rear cover on the SIGNAL ENTRANCE BOX.

e. *Removal of 26-Pair Cable Connectors* (fig. 7-6).

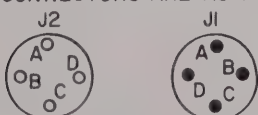
(1) Loosen the setscrews and slide the locking ring back on the cable.

(2) Remove the clamping bolts and clamp nuts from the cable clamp.



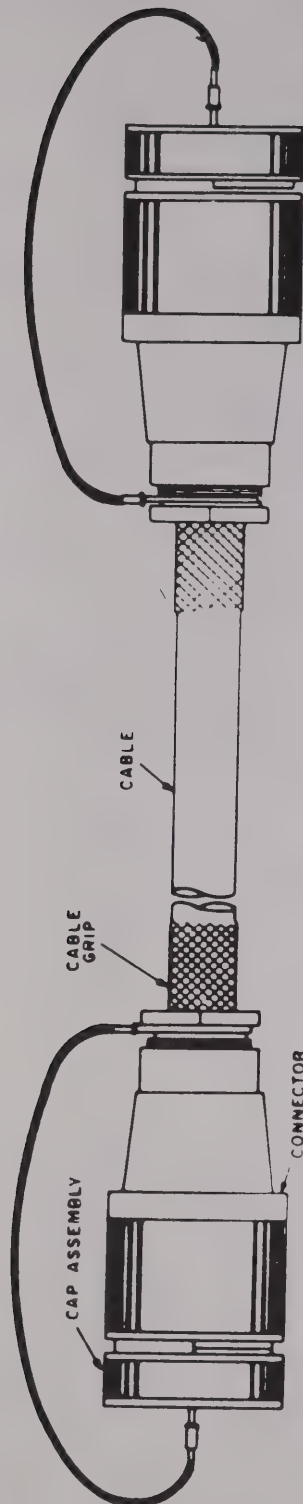
NOTES

1. INDICATES EQUIPMENT MARKING.
2. CONNECTORS ARE AS FOLLOWS:



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Figure 7-2. Overvoltage protection device, schematic-wiring diagram.



A. COMPLETE ASSEMBLY

NOTE

If cable assembly is used with a stub assembly, wrap red wire at open end of stub with green colored tape or use green tubing.



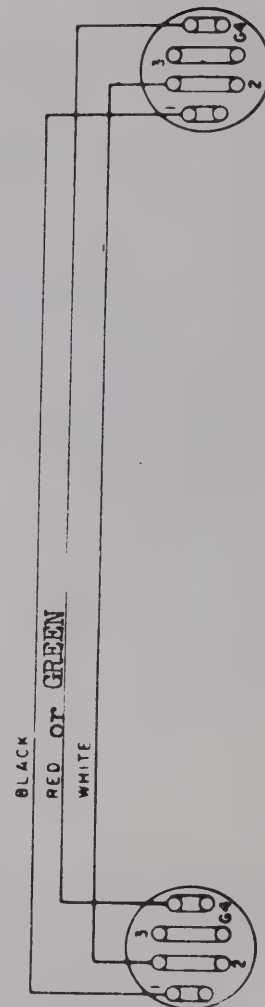
B. CABLE PREPARATION DETAILS



C. PIN END VIEW OF CONNECTOR



D. REAR VIEW OF CONNECTOR



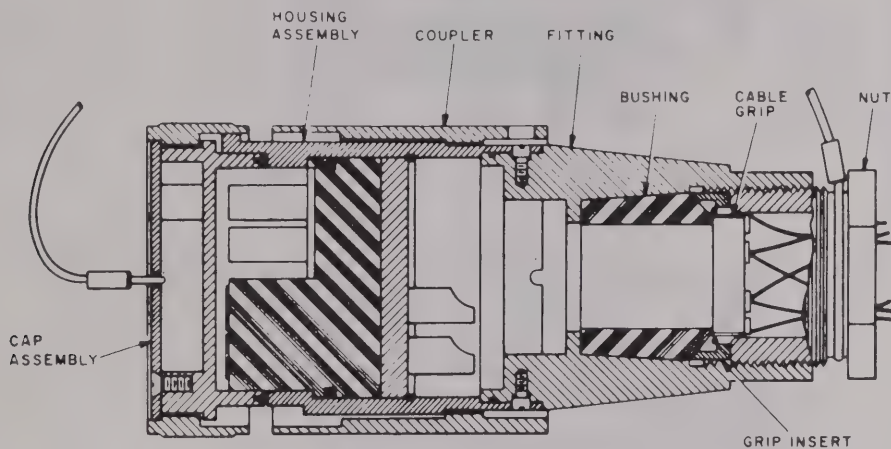
E. WIRING DIAGRAM

EL3TT058

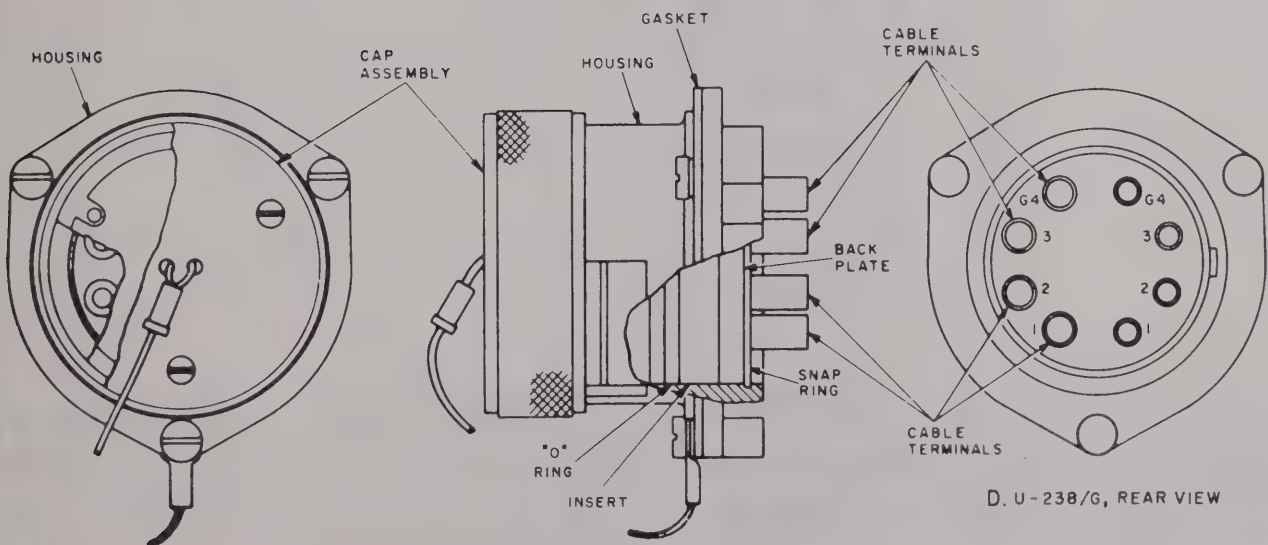
Figure 7-3. Power cable repair details.

- (3) Remove the retaining bolts and both sections of the cable clamp.
 - (4) Slide the enforcement and nylon insulator back on the cable.
 - (5) Remove the contact assembly retaining screws.
 - (6) Work the cable into the housing and lift the contact assembly out of the housing.
 - (7) Slide the separator away from the contact assembly.
 - (8) Tag and disconnect the leads.
 - (9) Remove the separator and slide the housing off the cable.
 - (10) Slide the nylon insulator, enforcement, locking ring, and cover off the cable.
- f. Replacement of 26-Pair Cable Connectors (fig. 7-6).

- (1) Slide the cover, locking ring, enforcement, and nylon insulator on the cable. Be sure the flange on the enforcement and nylon insulator is toward the cable end.
- (2) Slide the housing on the cable.
- (3) Install the separator with the leads properly positioned.
- (4) Position the contact assembly near the housing and connect the leads.
- (5) Replace and contact assembly in the housing. If necessary, work the cable out of the housing to provide clearance for the contact assembly.
- (6) Be sure the contact assembly is properly seated and secure it to the housing with the contact assembly retaining screws.
- (7) Slide the nylon insulator until its flange is flush against the housing.



A. U-237/G, INTERIOR DETAILS



B. U-238/G, EXTERIOR VIEW

C. U-238/G, INTERIOR DETAILS

D. U-238/G, REAR VIEW

Figure 7-4. Power cable connector and power receptacle assembly details.

EL3TT059

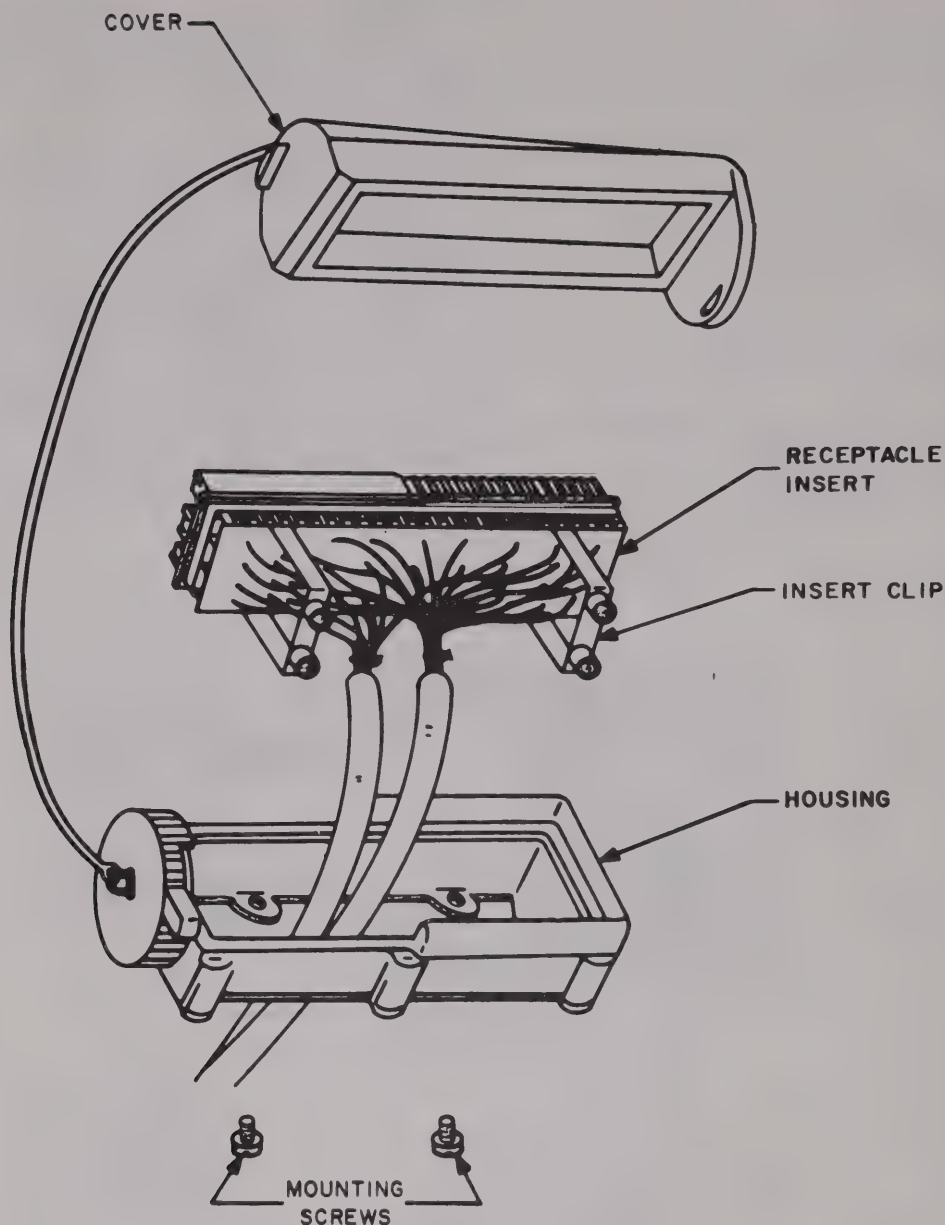


Figure 7-5. SIGNAL ENTRANCE BOX, 26-pair receptacle, exploded view.

(8) Slide the enforcement until its flange is flush against the nylon insulator.

(9) Replace the sections of the cable clamp and secure them with the retaining bolts.

(10) Replace the clamping bolts and nuts, and tighten them securely.

(11) Slide the locking ring into position on the housing and secure it with the setscrew.

(12) Replace the cover.

g. Repair of Ac Wiring.

(1) Refer to figure FO-3 ac power distribution schematic wiring diagram before working on assemblage ac wiring.

(2) Isolate the problem, using voltage or continuity checks as necessary.

(3) Ensure power is removed from circuit before attempting repair or replacement of defective wiring.

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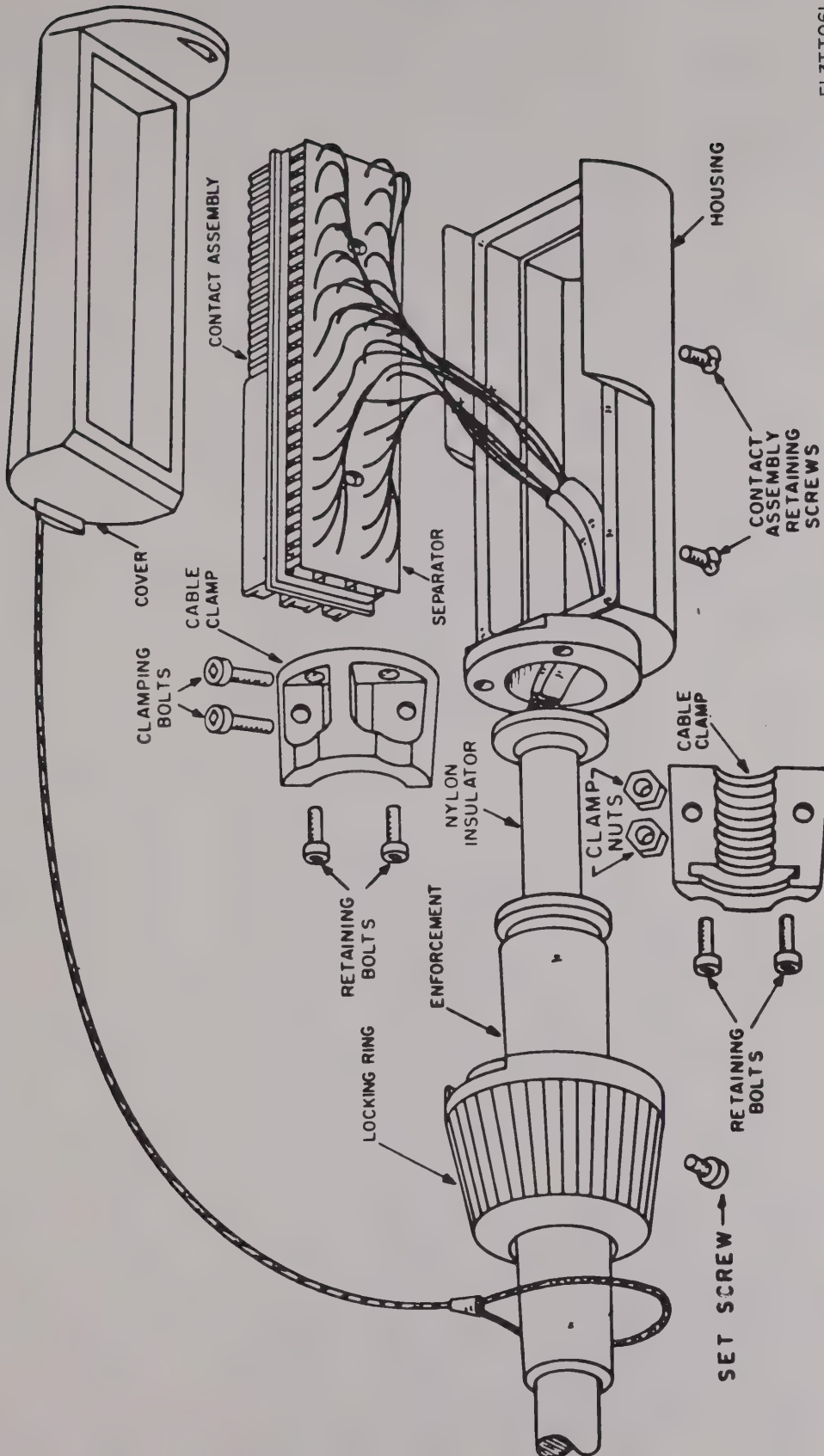


Figure 7-6. Twenty-six pair cable connector, exploded view.

APPENDIX A

REFERENCES

-
- | | |
|------------------|--|
| AR 55-38 | Reporting of Transportation Discrepancies in Shipments. |
| AR 380-40 | Policy for Safeguarding and Controlling COMSEC Information. |
| AR 735-11-2 | Reporting of Item Discrepancies Attributable to Shippers. |
| DA Pam 310-1 | Consolidated Index of Army Publications and Blank Forms. |
| DA Pam 310-9 | Index of Communications Security (COMSEC) Publications (UC). |
| KAM-258/TSEC | Organizational Maintenance Manual, TSEC/KG-27(U). |
| KAO-133/TSEC | Operator Instructions, TSEC/KG-27(U). |
| SB 11-6 | FSC Class 6135; Dry Battery Supply Data. |
| SB 11-30 | FSC Class 6135; Dry Battery Management Data. Quantity Unit Pack Requisitioning of Dry Batteries. |
| SB 38-100 | Preservation, Packaging, Packing and Marking Materials, Supplies, and Equipment Used by the Army. |
| TB 43-0118 | Field Instructions for Painting and Preserving Electronics Command Equipment Including Camouflage Pattern Painting of Electrical Equipment Shelters. |
| TB 43-0124 | Maintenance and Repair Procedure for Shelters, Electrical Equipment S-141/G and S-141B/G (NSN 5410-00-752-9698); S-144/G, S-144A/G, S-144B/G, S-144C/G and S-144D/G (NSN 5410-00-542-2532); S-250/G (NSN 5410-00-999-4935); S-250/G (Shielded) (NSN 5410-00-489-6076); S-280/G (NSN 5410-00-999-5269); S-280A/G (NSN 5410-00-999-6022); S-280B/G (NGN 5410-00-17-2868); S-280B/G (Shielded) (NSN 5410-00-001-4093); S-318/G (NSN 5410-00-763-2339) and S-318A/G (NSN 5410-00-116-7086). |
| TB 43-0125 | Installation of Communications-Electronic Equipment: Hookup of Electrical Cables To Mobile Generator Sets on Fielded Equipment to Meet Electrical Safety Standards. |
| TB 380-41-1 | Military Security: US Army Comsec Equipment Asset Reporting System (CEARS). |
| TB 750-10 | Painting, Replating, and Preserving Instructions for Communications Security Equipment. |
| TB 750-38 | Alteration of Communications Security Equipment. |
| TB SIG 291 | Safety Measures to be Observed When Installing and Using Whip Antennas, Field-Type Masts, Towers and Antennas and Metal Poles that are used with Communications, Radar and Direction Finder Equipment. |
| TM 5-6115-365-15 | Operator's, Organizational, Direct Support, General Support, and Depot Maintenance Manual (Including Repair Parts and Special Tools List): Generator Sets, Gasoline and Diesel Engine Driven, Trailer Mounted, PU-236A/G, PU-236/G (NSN 6115-00-393-1709), PU-236B/G (6115-00-738-6334) PU-253A/U, PU-253/U (6115-00-697-2402), PU-304C/MPQ-4 (6115-00-056-8421) PU-322/G (6115-00-577-8471), PU-332A/G (6115-00-738-8336), PU-375A/G, PU-375/G (6115-00-753-2231), PU-375B/G (6115-00-931-6789), PU-401/M (6115-00-823-2217), PU-402/M (6115-00-722-3760), PU-406/M (6115-00-738-6342), PU-409/M (6115-00-702-3343), PU-409A/M (6115-00-733-6338), PU-495/G (6115-00-823-2218), PU-551/G (6115-00-889-1307), PU-564A/G (6115-00-728-6341), PU-564B/G (6115-00-179-2789), PU-617/M (6115-00-738-6335), PU-618/M (6115-00-738-6337), PU-619/M (6115-00-738-6339), PU-620/M (6115-00-738-6340), PU-625/G (6115-00-837-3915), PU-628/G (6115-00-087-0873), PU-629/G (6115-00-937-5555), PU-631/G (6115-00-059-5172), PU-656/G (6115-00-939-3296), and PU-650B/G (6115-00-258-1622). |

| | |
|------------------------|---|
| TM 11-2057A | Test Set TA-27B/TSM. |
| TM 11-5410-213-14P | Operator's, Organizational, Direct Support, and General Support Maintenance Repair Parts and Special Tools Lists (Including Depot Maintenance Repair Parts and Special Tools) for Shelters, Electrical Equipment S-280A/G (NSN 5410-00-999-6022) and S-280B/G (NSN 5410-00-117-2868). |
| TM 11-5805-201-12 | Operator and Organizational Maintenance Manual: Telephone Set. TA-312/PT (NSN 5805-00-543-0012). |
| TM 11-5805-201-20P | Organizational Maintenance Repair Parts and Special Tools Lists: Telephone Set TA-312/PT (NSN 5805-00-543-0012). |
| TM 11-5805-201-34P | Direct Support and General Support Maintenance Repair Parts and Special Tools Lists (Including Depot Maintenance Repair Parts and Special Tools) for Telephone Set TA-312/PT (NSN 5805-00-543-0012). |
| TM 11-5805-201-35 | Direct Support, General Support, and Depot Maintenance Manual (Including Repair Parts and Special Tools) Telephone Set TA-312/PT (NSN 5805-00-543-0012). |
| TM 11-5805-367-12 | Operator's and Organizational Maintenance Manual: Multiplexers, TD-202/U (NSN 5805-00-884-2176), TD-203/U (5805-00-884-2177), TD-204/U (5805-00-900-8200), TD-352/U (5805-00-900-8199) and TD-353/U (5805-00-985-9153); Restorers, Pulse Form, TD-206/G (5805-00-868-8078) and TD-206B/G (5805-01-020-2251) and Converters, Telephone Signal, CV-1548/G (5805-00-069-8795) and CV-1548A/G (5805-00-069-8795). |
| TM 11-5805-367-20P-1-1 | Organizational Maintenance Repair Parts and Special Tools Lists for Multiplexer TD-202/U (NSN 5805-00-884-2176). |
| TM 11-5805-367-20P-2 | Organizational Maintenance Repair Parts and Special Tools Lists for Multiplexer TD-204/U (NSN 5805-00-900-8200). |
| TM 11-5805-367-20P-3-1 | Organizational Maintenance Repair Parts and Special Tools Lists for Multiplexer TD-352/U (NSN 5805-00-900-8199). |
| TM 11-5805-367-20P-5 | Organizational Maintenance Repair Parts and Special Tools Lists for Converter, Telephone Signal CV-1548/G and CV-1548A/G (NSN 5805-00-069-8795). |
| TM 11-5805-367-34-5 | Direct Support and General Support Maintenance Manual: Converters, Telephone Signal, CV-1548/G and CV-1548A/G. |
| TM 11-5805-367-34P-1-1 | Direct Support and General Support Maintenance Repair Parts and Special Tools Lists (Including Depot Maintenance Repair Parts and Special Tools) for Multiplexer TD-202/U (NSN 5805-00-884-2176). |
| TM 11-5805-367-34P-2 | Direct Support and General Support Maintenance Repair Parts and Special Tools Lists (Including Depot Maintenance Repair Parts and Special Tools) for Multiplexer TD-204/U (NSN 5805-00-900-8199). |
| TM 11-5805-367-34P-3-1 | Direct Support and General Support Maintenance Repair Parts and Special Tools Lists (Including Depot Maintenance Repair Parts and Special Tools) for Multiplexer TD-352/U (NSN 5805-00-900-8199). |
| TM 11-5805-367-34P-5 | Direct Support and General Support Maintenance Repair Parts and Special Tools Lists (Including Depot Maintenance Repair Parts and Special Tools) for Converter, Telephone Signal CV-1548/G and CV-1548A/G (NSN 5805-00-069-8795). |
| TM 11-5805-367-35/1 | Direct Support, General Support and Depot Maintenance Manual for Multiplexers TD-202/U (NSN 5805-00-884-2176) and TD-203/U (NSN 5805-00-884-2177). |
| TM 11-5805-367-35/2 | Direct Support, General Support, and Depot Maintenance Manual: Multiplexer TD-204/U. |
| TM 11-5805-367-35/3 | Direct Support, General Support, and Depot Maintenance Manual: Multiplexers TD-352/U and TD-353/U. |
| TM 11-5820-461-12 | Operator and Organizational Maintenance Manual: Radio Sets AN/GRC-50(V)1 (NSN 5820-00-892-3851) AN/GRC-50(V)2 |

(5820-00-892-3852) AN/GRC-50(V)3 (5820-00-892-3853)
 AN/GRC-50(V)4 (5820-00-892-3854) AN/GRC-50(V)5
 (5820-00-892-3855) AN/GRC-50A(V)1 (5820-00-933-6193)
 AN/GRC-50A(V)2 (5820-00-933-6192) AN/GRC-50(V)3
 (5820-00-933-6191) AN/GRC-50A(V)4 (5820-00-933-6190)
 AN/GRC-50A(V)5 (5820-00-933-6189) AN/GRC-50A(V)6
 (5820-00-936-5480) AN/GRC-50A(V)7 (5820-00-936-5481)
 AN/GRC-50A(V)8 (5820-00-935-0089) AN/GRC-50A(V)9
 (5820-00-878-8635) AN/GRC-50A(V)10 (5820-00-878-8634)
 AN/GRC-50A(V)11 (5820-00-136-4966).

TM 11-5820-461-20P

Organizational Maintenance Repair Parts and Special Tools Lists for Radio Set, AN/GRC-50(V)1 (NSN 5820-00-892-3851), AN/GRC-50(V)2 (5820-00-892-3852), AN/GRC-50(V)3 (5820-00-892-3853), AN/GRC-50(V)4 (5820-00-892-3854), AN/GRC-50(V)5 (5820-00-892-3855), AN/GRC-50A(V)1 (5820-00-933-6193), AN/GRC-50A(V)2 (5820-00-933-6192), AN/GRC-50A(V)3 (5820-00-933-6191), AN/GRC-50A(V)4 (5820-00-933-6190), AN/GRC-50A(V)5 (5820-00-933-6189), AN/GRC-50A(V)6 (5820-00-936-5480), AN/GRC-50A(V)7 (5820-00-936-5481), AN/GRC-50A(V)8 (5820-00-935-0089), AN/GRC-50A(V)9 (5820-00-878-8635), AN/GRC-50A(V)10 (5820-00-878-8634) and AN/GRC-50A(V)11 (5820-00-136-4966).

TM 11-5820-461-34P

Direct Support and General Support Maintenance Repair Parts and Special Tools Lists (Including Depot Maintenance Repair Parts and Special Tools) for Radio Sets AN/GRC-50(V)1 (NSN 5820-00-892-3851), AN/GRC-50(V)2 (NSN 5820-00-892-3852), AN/GRC-50(V)3 (NSN 5820-00-892-3853), AN/GRC-50(V)4 (NSN 5820-00-892-3854), AN/GRC-50(V)5 (NSN 5820-00-892-3855), AN/GRC-50A(V)1 (NSN 5820-00-933-6193), AN/GRC-50A(V)2 (NSN 5820-00-933-6192), AN/GRC-50A(V)3 (NSN 5820-00-933-6191), AN/GRC-50A(V)4 (NSN 5820-00-933-6190), AN/GRC-50A(V)5 (NSN 5820-00-933-6189), AN/GRC-50A(V)6 (NSN 5820-00-936-5480), AN/GRC-50A(V)7 (NSN 5820-00-936-5481), AN/GRC-50A(V)8 (NSN 5820-00-935-0089), AN/GRC-50A(V)9 (NSN 5820-00-878-8635), AN/GRC-50A(V)10 (NSN 5820-00-878-8634), and AN/GRC-50A(V)11 (NSN 5820-00-136-4966).

TM 11-5820-517-14P

Operator's Organizational, Direct Support, and General Support Maintenance Repair Parts and Special Tools Lists (Including Depot Maintenance Repair Parts and Special Tools): Antenna AT-903/G (NSN 5820-00-856-9925).

TM 11-5820-538-12

Operator's and Organizational Maintenance Manual: Mast AB-577/GRC (NSN 5820-00-892-3862) and Extension Kit, Mast MK-806/GRC (5895-00-691-2344).

TM 11-5820-538-20P

Organizational Repair Parts and Special Tools List for Mast AB-577/GRC (NSN 5820-00-892-3862) and Extension Kit, Mast MK-806/GRC (5820-00-691-2344).

TM 11-5820-538-34P

Direct Support and General Support Maintenance Repair Parts and Special Tools List (Including Depot Maintenance Repair Parts and Special Tools) for Mast AB-577/GRC (NSN 5820-00-892-3862) and Extension Kit, Mast MK-806/GRC (5820-00-691-2344).

TM 11-5820-538-35

DS, GS and Depot Maintenance Manual: Mast AB-577/GRC.

TM 11-5830-221-12

Operator's and Organizational Maintenance Manual: Intercommunication Stations LS-147A/FI, LS-147B/FI, LS-147C/FI, LS-147D/FI (NSN 5830-00-752-5357).

TM 11-5830-221-24P

Organizational, Direct Support, and General Support Maintenance Repair Parts and Special Tool Lists for Telecommunication Station LS-147C/FI (NSN 5830-00-752-5357).

- | | |
|--------------------|--|
| TM 11-5830-221-35 | Field and Depot Maintenance Manual: Intercommunication Stations LS-147A/FI, LS-147B/FI, LS-147C/FI, and LS-147D/FI (NSN 5830-00-752-5357). |
| TM 11-5935-205-14P | Operator's, Organizational, Direct Support, and General Support Maintenance Repair Parts and Special Tools List (Including Depot Maintenance Repair Parts and Special Tools): Connectors, Receptacle, Electrical U-187/G and U-187A/G (NSN 5935-00-682-0381). |
| TM 11-5965-206-14P | Operator's, Organizational, Direct Support, and General Support Maintenance Repair Parts and Special Tools Lists (Including Depot Maintenance Repair Parts and Special Tools) Headset-Microphone H-91A/U (NSN 5965-00-669-6871); Handset-Headset H-144/U, H-144A/U, H-144B/U, and H-144C/U (NSN 5965-00-682-2769); and Headset; Microphone H-210/G (NSN 5965-00-892-1068). |
| TM 11-5965-224-14P | Operator's, Organizational, Direct Support and General Support Maintenance Repair Parts and Special Tools List (Including Depot Maintenance Repair Parts and Special Tools): Handsets, H-60/PT (NSN 5965-00-669-9145) and H-165/U (NSN 5965-00-543-1837). |
| TM 11-6110-245-15 | Operator, Organizational, Direct Support, General Support, and Depot Maintenance Manual: Voltage Regulator, CN-514/GRC. |
| TM 11-6625-240-20P | Organizational Maintenance Repair Parts and Special Tool Lists: Test Set TS-27B/TSM (NSN 6625-00-188-3232). |
| TM 11-6625-240-40P | General Support Maintenance Repair Parts and Special Tool Lists: Test Set TS-27B/TSM (NSN 6625-00-188-3232). |
| TM 38-750 | The Army Maintenance Management Systems (TAMMS). |
| TM 750-244-2 | Procedures for Destruction of Electronics Material to Prevent Enemy Use (Electronics Command). |

APPENDIX B

COMPONENTS OF END ITEM LIST

Section I. INTRODUCTION

B-1. Scope

This appendix lists integral components of and basic issue items for the AN/TRC-117(*) to help you inventory items required for safe and efficient operation.

B-2. General

a. Section II. Integral Components of the End Item. These items, when assembled, comprise the AN/TRC-117(*) and must accompany it whenever it is transferred or turned in. The illustrations will help you identify the items.

b. Section III. Basic Issue Items. These are the minimum essential items required to place the AN/TRC-117(*) in operation, to operate it, and to perform emergency repairs. Although shipped separately packed they must accompany accountable officers. The illustrations will assist with hard to identify items. This manual is your authority to requisition replacement BII, based on TDE/MTOE authorization of the end item.

B-3. Explanation of Columns

- a. Illustration.* This column is divided as follows:
- (1) *Figure Number.* Indicates the figure number of the illustration on which the item is shown.
 - (2) *Item Number.* The number used to identify the item called out in the illustration.
- b. National Stock Number.* Indicates the Na-

tional stock number assigned to the item and which will be used for requisitioning.

c. Part Number. Indicates the primary number used by the manufacturer, which controls the design and characteristics of the item by means of its engineering drawings, specifications, standards, and inspection requirements to identify an end item or range of items.

d. Description. Indicates the Federal item name and, if required, a minimum description to identify the end item.

e. Location. The physical location of each item listed is given in this column. The lists are designed to inventory all items in one area of the major item before moving on to an adjacent item.

f. Usable on Code. USABLE ON codes are included to help you identify which component items are used on the different models. Usable on code 2QR refers to the S-330A/TRC-117, DVR refers to the S-330B/TRC-117. Where no code is noted, the component is used on all versions of the AN/TRC-117(*).

g. Quantity Required (Qty Req'd). This column lists the quantity of each item required for a complete major item.

h. Quantity. This column is left blank for use during an inventory under the Rcv'd column, list the quantity you actually receive on your major item. The Date columns are for use when you inventory the major item at a later date, such as for shipment to another site.

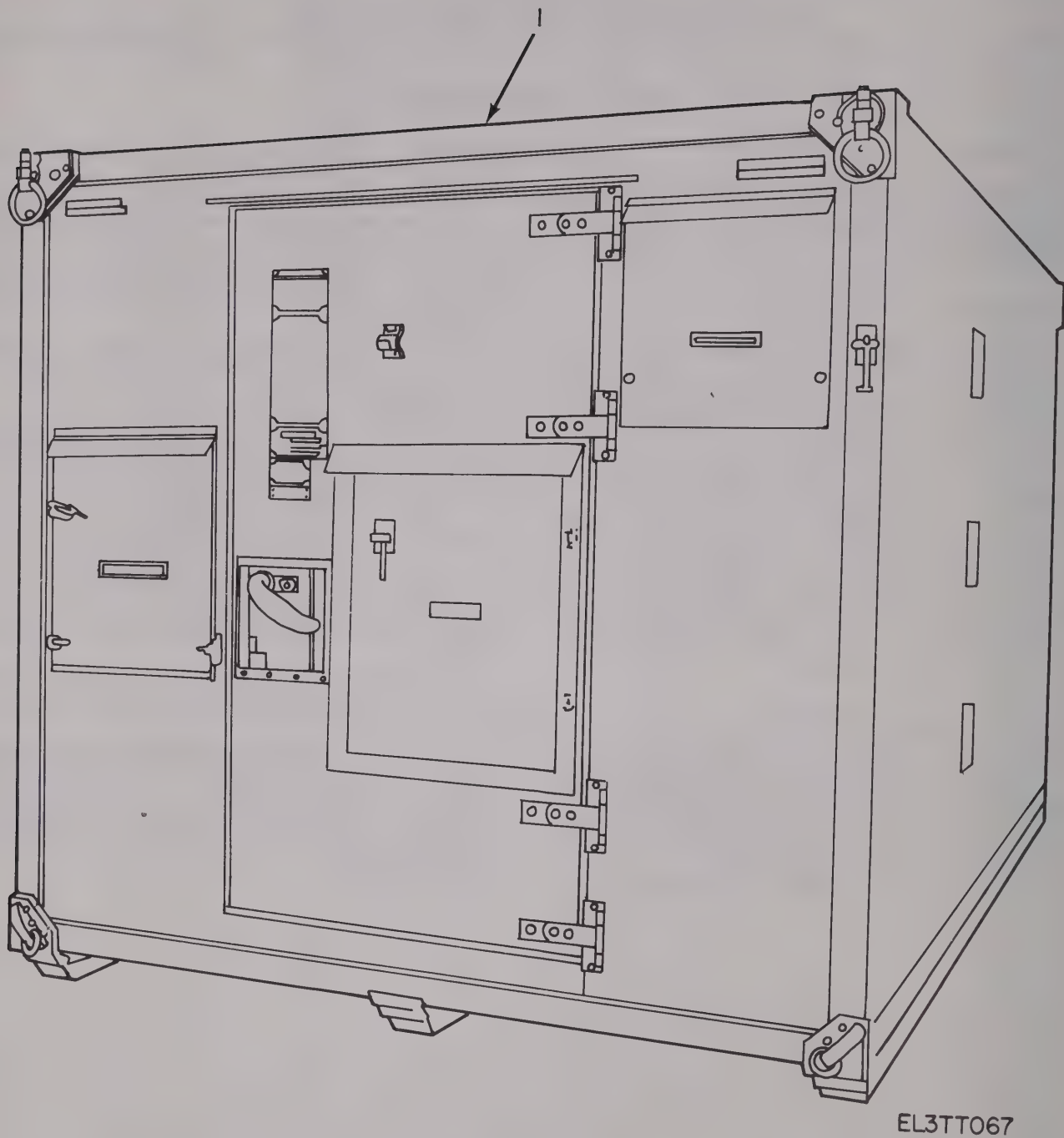
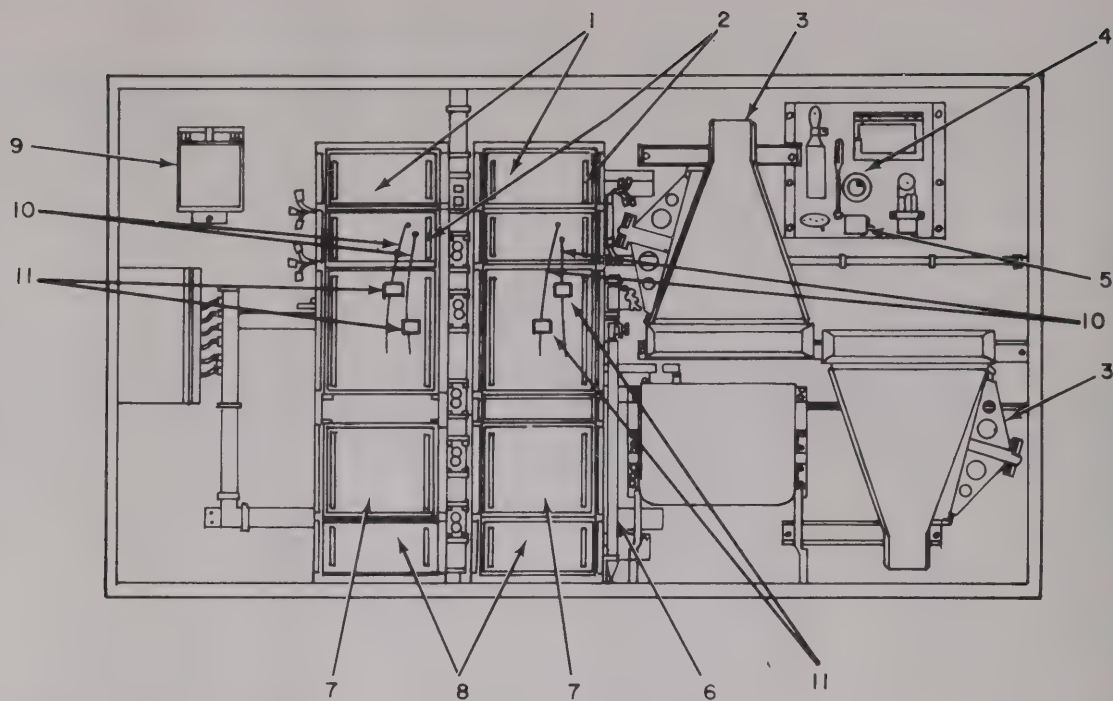


Figure B-1. Shelter, Electrical Equipment S-330A/TRC-117(V) or S-330B/TRC-117(V).

SECTION 11 INTEGRAL COMPONENTS OF END ITEM

| 1 ILLUSTRATION | | 2 NATIONAL STOCK NUMBER | 3 DESCRIPTION PART NUMBER (FSCM) | 4 LOCATION | 5 USABLE ON CODE | 6 QTY REQD | 7 QUANTITY | |
|-------------------|------------------|----------------------------------|---|---------------|---------------------------|------------------|---------------|------|
| A FIG NO. | B ITEM NO. | | | | | | RCVD | DATE |
| B-1 | 1 | 5410-00-933-6837 | SHELTER, ELECTRICAL EQUIPMENT: MODIFIED S-280A/G S-330A/TRC-117(V) OR (80058) | | 2QR | 1 | | |
| B-1 | 1 | 5410-00-880-2968 | SHELTER, ELECTRICAL EQUIPMENT: MODIFIED S-280B/G S-330B/TRC-117(V) (80058) | | DVK | 1 | | |

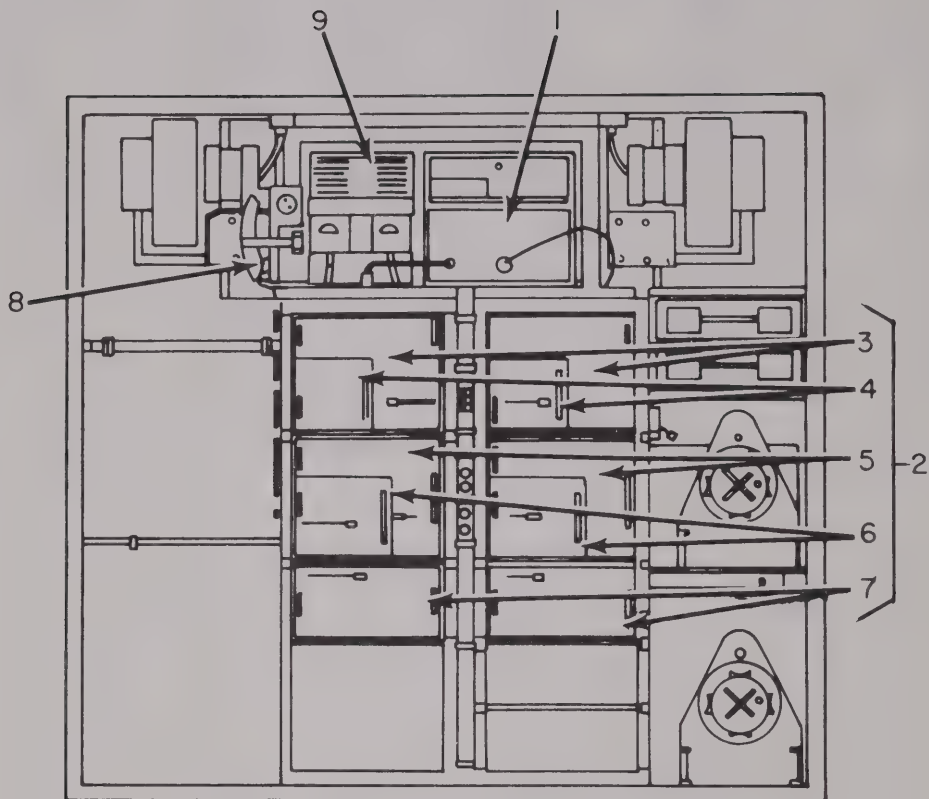


EL3TT104

Figure B-2. Radio Terminal Set AN/TRC-117(*), Interior Roadside Wall, Integral Components.

SECTION II INTEGRAL COMPONENTS OF END ITEM

| (1) ILLUSTRATION | | (2) NATIONAL STOCK NUMBER | (3) DESCRIPTION (FSCM) | (4) LOCATION | (5) USABLE ON CODE | (6) QTY REQD | (7) QUANTITY | |
|---------------------|--------------------|------------------------------------|---|--------------------|-----------------------------|--------------------|-----------------|------|
| (A) FIG NO. | (B) ITEM NO. | | | | | | RCVD | DATE |
| B-2 | 1 | 5805-00-900-8200 | MULTIPLEXER TD-204/U (80058) | ROADSIDE WALL | | 2 | | |
| B-2 | 2 | 5805-00-884-2176 | MULTIPLEXER TD-202/U (80058) | ROADSIDE WALL | | 2 | | |
| B-2 | 3 | 5820-00-856-9925 | ANTENNA AT-903/G (80058) | ROADSIDE WALL | | 2 | | |
| B-2 | 4 | 6645-00-950-8599 | CLOCK (3 INCH) SC-C-681411 (79300) | COMMON ITEMS PANEL | | 1 | | |
| B-2 | 5 | 7520-00-162-6178 | SHARPENER, PENCIL SC-G539503 (80063) | COMMON ITEMS PANEL | | 1 | | |
| B-2 | 6 | 4030-00-298-1382 | STAKE, GUY GP-113/G (80058) | ROADSIDE WALL | | 7 | | |
| B-2 | 7 | 5805-00-900-8199 | MULTIPLEXER TD-352/U (80058) | ROADSIDE WALL | | 2 | | |
| B-2 | 8 | 5805-00-069-8795 | CONVERTER, TELEPHONE SIGNAL CV-1548/G (80058) | ROADSIDE WALL | | 2 | | |
| B-2 | 9 | 7520-00-159-4863 | BASKET, WASTEPAPER SC-D-530454 (80063) | ROADSIDE WALL | | 1 | | |
| B-2 | 10 | 5995-01-135-2273 | CABLE ASSEMBLY RF SC-D-784100 (80063) | ROADSIDE WALL | | 4 | | |
| B-2 | 11 | 5950-01-101-6700 | WIDEBAND TRANSFORMER SC-C-781311 (80063) | ROADSIDE WALL | | 4 | | |



EL3TT069

Figure B-3. Radio Terminal Set AN/TRC-117(*), interior front wall, integral components.

SECTION II INTEGRAL COMPONENTS OF END ITEM

| 1 ILLUSTRATION | | 2 NATIONAL STOCK NUMBER | (3) DESCRIPTION PART NUMBER (FSCM) | 4 LOCATION | 5 USABLE ON CODE | 6 QTY REQD | 7 QUANTITY | |
|-------------------|------------------|----------------------------------|--|---------------|---------------------------|------------------|---------------|------|
| A FIG NO. | B ITEM NO. | | | | | | RCVD | DATE |
| B-3 | 1 | 6110-00-064-5478 | REGULATOR, VOLTAGE CN-514/GRC (80058) | FRONT WALL | | 1 | | |
| B-3 | 2 | 5820-00-936-5480 | RADIO SET AN/GRC-50A6 (80058) | FRONT WALL | | 2 | | |
| | | | WHICH INCLUDES: | | | | | |
| B-3 | 3 | 5820-00-082-4292 | RECEIVER, RADIO R-1331(P)/GRC (80058) | FRONT WALL | | 2 | | |
| B-3 | 4 | 5820-00-082-4294 | AMPLIFIER-CONVERTER AM-1956A/GRC (80058) | FRONT WALL | | 2 | | |
| | | | OR | | | | | |
| B-3 | 4 | 5820-00-082-4293 | AMPLIFIER-CONVERTER AM-1955A/GRC (80058) | FRONT WALL | | 2 | | |
| B-3 | 5 | 5820-00-892-3863 | TRANSMITTER, RADIO T-893(P)/GRC (80058) | FRONT WALL | | 2 | | |
| B-3 | 6 | 5820-00-892-3857 | AMPLIFIER-OSCILLATOR AM-1958A/GRC (80058) | FRONT WALL | | 2 | | |
| | | | OR | | | | | |
| B-3 | 6 | 5820-00-892-3856 | AMPLIFIER-OSCILLATOR AM-1957/GRC (80058) | FRONT WALL | | 2 | | |
| B-3 | 7 | 5820-00-889-0857 | POWER SUPPLY PP-2054/GRC (80058) | FRONT WALL | | 2 | | |
| B-3 | 8 | 5805-00-543-0012 | TELEPHONE SET TA-312/PT (80058) | FRONT WALL | | 1 | | |
| B-3 | 9 | 5820-00-892-3861 | DUMMY LOAD, ELECTRICAL DA-189/GRC (80058) | FRONT WALL | | 2 | | |

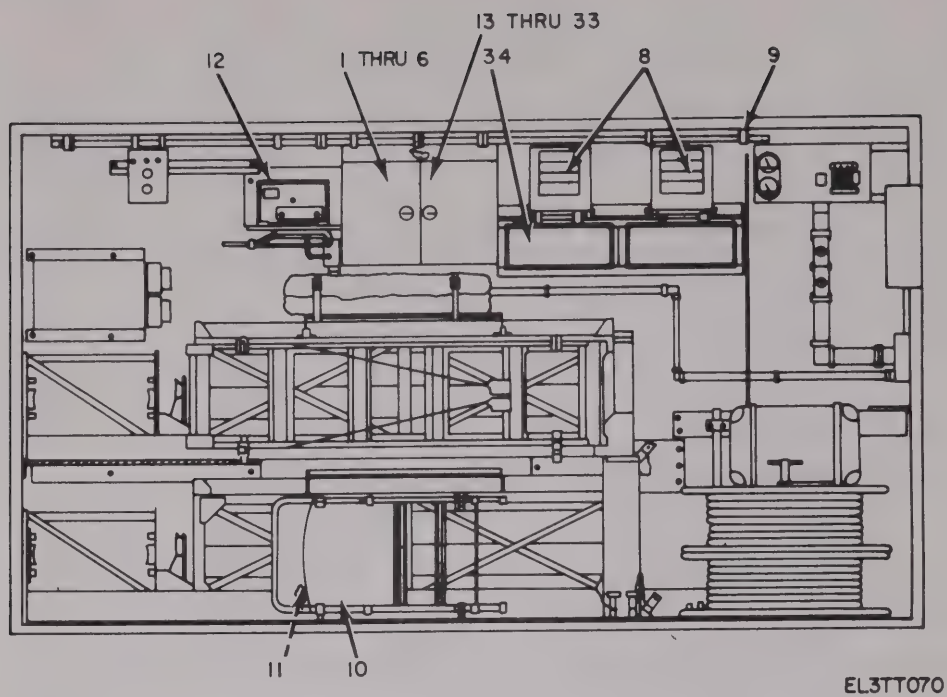


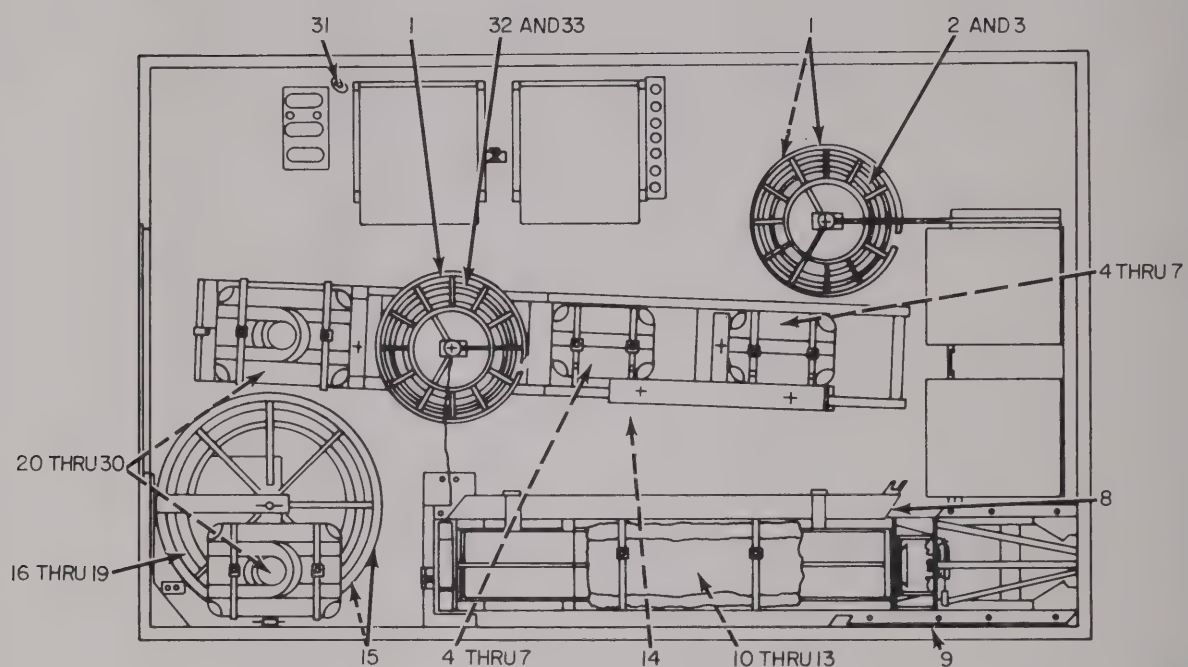
Figure B-4. Radio Terminal Set AN/TRC-117(*), Interior Wall, Integral Components.

SECTION II INTEGRAL COMPONENTS OF END ITEM

| 1 ILLUSTRATION | | 2 NATIONAL STOCK NUMBER | 3 DESCRIPTION PART NUMBER. (FSCM) | 4 LOCATION | 5 USABLE ON CODE | 6 QTY REQD | 7 QUANTITY | |
|-------------------|------------------|----------------------------------|--|----------------------|---------------------------|------------------|---------------|------|
| A FIG NO. | B ITEM NO. | | | | | | RCVD | DATE |
| B-4 | 1 | 6605-00-151-5337 | COMPASS, MAGNETIC MIL-C-10436 (81349) | CURBSIDE SPARE PARTS | | 1 | | |
| B-4 | 2 | 5120-00-946-5148 | GRIP, CABLE (SIGNAL) (17 IN.) SC-B-539592 (80063) | CURBSIDE SPARE PARTS | | 5 | | |
| B-4 | 3 | 5120-00-946-5114 | GRIP, CABLE (POWER) (15 IN.) SC-B-539593 (80063) | CURBSIDE SPARE PARTS | | 5 | | |
| B-4 | 4 | 5975-00-400-2630 | GRIP, CABLE (VIDEO) ND-0104 (80063) | CURBSIDE SPARE PARTS | | 2 | | |
| B-4 | 5 | 5965-00-892-3850 | HANDSET H-156/U (80058) | CURBSIDE SPARE PARTS | | 2 | | |
| B-4 | 6 | 5965-00-669-6871 | HEADSET, MICROPHONE H-91A/U (80058) | CURBSIDE SPARE PARTS | | 1 | | |
| B-4 | 7 | 4940-00-752-2525 | LEAD, ELECTRICAL (GROUND STRAP) SM-B-539592 (80063) | CURBSIDE SPARE PARTS | | 1 | | |
| B-4 | 8 | 4520-00-177-6198 | HEATER, SPACE, ELECTRICAL DL-SC-B-539644 (80063) | CURBSIDE WALL | | 2 | | |
| B-4 | 9 | 5975-00-224-5260 | ROD, GROUND MX-148/G (80058) | CURBSIDE WALL | | 2 | | |
| B-4 | 10 | 7105-00-269-8463 | CHAIR, FOLDING SC-D-539471 (80063) | CURBSIDE WALL | | 1 | | |
| B-4 | 11 | 7210-00-753-3043 | CUSHION, CHAIR SC-C-539526 (80063) | CURBSIDE WALL | | 1 | | |
| B-4 | 12 | 5830-00-752-5357 | INTERCOMMUNICATIONS STATION LS-147C/FI (80058) | CURBSIDE WALL | | 1 | | |
| B-4 | 13 | 5995-00-889-0848 | CABLE ASSEMBLY, POWER, ELECTRICAL 3 FT. 6 IN. LONG (XMTR TO POWER SUPPLY) CX-4558/U (80058) | CURBSIDE STORAGE | | 1 | | |
| B-4 | 14 | 5995-00-810-6276 | CABLE ASSEMBLY, POWER, ELECTRICAL (OVERVOLTAGE CONTROL TO CN-514/GRC) 3 FT. 6 IN. SC-C-542021 (80063) | CURBSIDE STORAGE | | 1 | | |
| B-4 | 15 | 5995-00-003-3320 | CABLE ASSEMBLY, RF (RADIO PATCH) 1 FT. 6 IN. SC-D-585119 GR. I (80063) | CURBSIDE STORAGE | | 5 | | |
| B-4 | 16 | 5995-00-930-9510 | CABLE ASSEMBLY, POWER (RCVR TO POWER SUPPLY) 4 FT. SC-C-547175 GR. I (80063) | CURBSIDE STORAGE | | 4 | | |
| B-4 | 17 | 5995-00-933-5788 | CABLE ASSEMBLY POWER (TO MULTIPLEXERS AND SIGNAL CONVERTERS) 4 FT. CX-1173B/U (80058) | CURBSIDE STORAGE | 2QR | 8 | | |
| OR | | | | | | | | |
| B-4 | 18 | 5995-00-781-6852 | CABLE ASSEMBLY POWER (TO MULTIPLEXERS AND SIGNAL CONVERTER) 4 FT. SC-C-547174-GR. I (80063) | CURBSIDE STORAGE | DVK | 8 | | |
| B-4 | 19 | 5995-00-313-1600 | CABLE ASSEMBLY (ORDER WIRE RADIO REPEATER) 1 FT. 6 IN. SC-D-585158 (80063) | CURBSIDE STORAGE | DVK | 1 | | |
| B-4 | 20 | 5995-00-003-1176 | CABLE ASSEMBLY (RADIO/CABLE REPEATER) 1 FT. 6 IN. SC-D-585123 GR. I (80063) | CURBSIDE STORAGE | DVK | 2 | | |
| B-4 | 21 | 5995-00-192-9607 | CABLE ASSEMBLY, RF (VIDEO PATCH) 1 FT. 6 IN. SC-D-595511 GR. 12 (80063) | CURBSIDE STORAGE | DVK | 20 | | |

SECTION II INTEGRAL COMPONENTS OF END ITEM

| (1) ILLUSTRATION | | (2) NATIONAL STOCK NUMBER | (3) DESCRIPTION PART NUMBER (FSCM) | (4) LOCATION | (5) USABLE ON CODE | (6) QTY REQD | (7) QUANTITY | |
|---------------------|--------------------|------------------------------------|--|------------------|-----------------------------|--------------------|-----------------|------|
| (A) FIG NO. | (B) ITEM NO. | | | | | | RCVD | DATE |
| B-4 | 22 | 5995-00-341-5196 | CABLE ASSEMBLY RF (CABLE PATCH) 7 FT LG SC-D-627081 GR 7 (80063) | CURBSIDE STORAGE | | 5 | | |
| B-4 | 23 | 5995-00-933-5800 | CABLE ASSEMBLY, RF 4 FT (INTERCON- NECTION BETWEEN MULTIPLEXERS) CG-1040B/U (80058) | CURBSIDE STORAGE | 2QR | 14 | | |
| | | | OR | | | | | |
| B-4 | 24 | 5995-00-935-5289 | CABLE ASSEMBLY, RF 6 FT CG-1040B/U (80058) | CURBSIDE STORAGE | 2QR | 14 | | |
| B-4 | 25 | 5995-00-889-0852 | CABLE ASSEMBLY, RADIO FREQUENCY 3 FT LG (XMTR to RCVR) CG-7188/U (80058) | CURBSIDE STORAGE | | 3 | | |
| B-4 | 26 | 5995-00-889-0853 | CABLE ASSEMBLY, RADIO FREQUENCY 6 FT LG (DUMMY LOAD TO XMTR) CG-7188/G (80058) | CURBSIDE STORAGE | | 2 | | |
| B-4 | 27 | 5995-00-913-0470 | CABLE ASSEMBLY, SPECIAL PURPOSE, ELECT 5 FT (ORDER WIRE PATCH THRU BETWEEN TD-204'S) CX-7874/TCC (80058) | CURBSIDE STORAGE | | 1 | | |
| B-4 | 28 | 5995-00-913-0471 | CABLE ASSEMBLY, SPECIAL PURPOSE, ELECT 5 FT (AUDIO CHANNELS BETWEEN TD-352/U AND CV-1548/G) CX-7870/TCC (80058) | CURBSIDE STORAGE | | 6 | | |
| B-4 | 29 | 5995-00-889-0855 | CABLE ASSEMBLY, SPECIAL PURPOSE, ELECTRICAL 3 FT (AUDIO, XMTR TO RCVR) CX-4557/GRC (80058) | CURBSIDE STORAGE | | 2 | | |
| B-4 | 30 | 5995-00-933-6463 | CABLE ASSEMBLY, TELEPHONE 6 FT CX-1200/U (80058) | CURBSIDE STORAGE | | 1 | | |
| B-4 | 31 | 5995-00-933-6458 | CABLE ASSEMBLY, TELEPHONE 8 FT CX-1201/U (80058) | CURBSIDE STORAGE | | 1 | | |
| B-4 | 32 | 5995-00-913-0466 | CABLE ASSEMBLY, TELEPHONE 25 FT (ORDER WIRE EXTRACTOR CABLE) CX-7872/TCC (80058) | CURBSIDE STORAGE | | 1 | | |
| B-4 | 33 | 5995-00-235-5048 | CABLE ASSEMBLY, RADIO FREQUENCY CG-409H/U 1.5 FT (80058) | CURBSIDE STORAGE | | 5 | | |
| B-4 | 34 | | CARD STORAGE (80058) | CURBSIDE WALL | | 2 | | |



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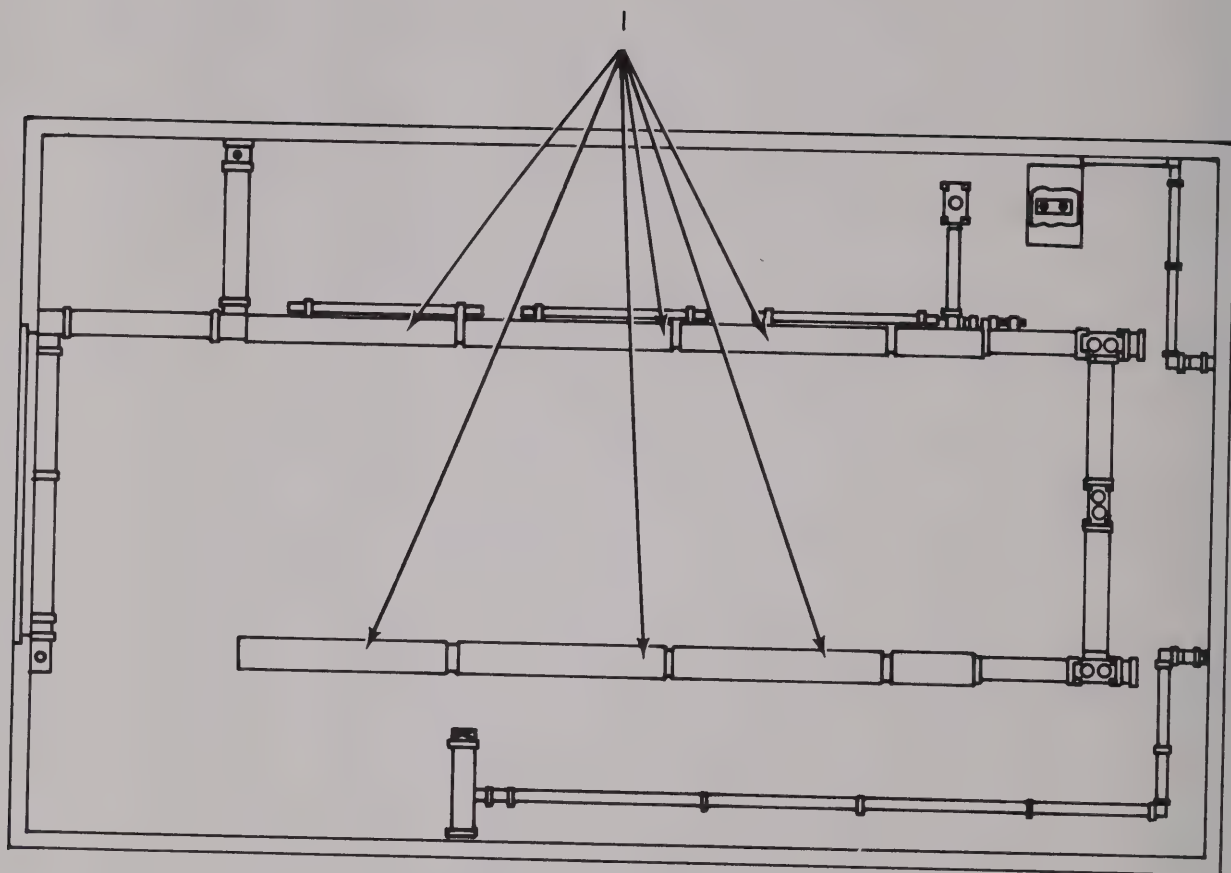
Figure B-5. Radio Terminal Set AN/TRC-117(*), floor plan, integral components.

SECTION II. INTEGRAL COMPONENTS OF END ITEM

| 1 ILLUSTRATION | | 2 NATIONAL STOCK NUMBER | 3 DESCRIPTION | | 4 LOCATION | 5 USABLE ON CODE | 6 QTY REQD | 7 QUANTITY | |
|-------------------|------------------|----------------------------------|--|---------|----------------------|---------------------------|------------------|---------------|------|
| A FIG NO. | B ITEM NO. | | PART NUMBER | (FSCM) | | | | RCVD | DATE |
| B-5 | 1 | 8180-00-656-1090 | REEL, CABLE RC-435/U | (80058) | FLOOR | | 3 | | |
| B-5 | 2 | 5995-00-985-7569 | CABLE ASSEMBLY, SIGNAL (26-PAIR) 250 FT. CX-4566()/G | (80058) | MTD ON RC-435/U | | 2 | | |
| B-5 | 3 | 5995-00-889-0803 | CABLE ASSEMBLY, TELEPHONE (26-PAIR) 15 FT. STUB CX-4760A/U | (80058) | MTD ON RC-435/U | | 1 | | |
| B-5 | 4 | 5820-00-973-0200 | MAST CAP SM-C-423587 | (80063) | INSIDE BG-102A | | 2 | | |
| B-5 | 5 | 4030-00-580-7833 | GUY ANCHOR (SCREW TYPE) BSP0850 | (73569) | INSIDE GUY STAKE BAG | | 6 | | |
| B-5 | 6 | 5975-00-395-9002 | CLAMP, GUY STAKE SC-C-547187 | (80063) | ON GP-113 | | 7 | | |
| B-5 | 7 | 4030-00-599-9338 | SHACKLE (FOR GP-113) SC-C-64939 | (80063) | ON GP-113 | | 7 | | |
| B-5 | 8 | 2540-00-892-6243 | LADDER, BOARDING MX-3391/U | (80058) | FLOOR | | 1 | | |
| B-5 | 9 | 5820-00-892-3862 | MAST ASSEMBLY AB-577/GRC | (80058) | FLOOR | | 2 | | |
| B-5 | 10 | 5210-00-221-1882 | TAPE, STEEL MEASURING (100 FT.) SM-D-350561 | (80063) | INSIDE BAG | | 1 | | |
| B-5 | 11 | 4030-00-187-5261 | STAKE, GUY GP-2 | (80058) | INSIDE GUY STAKE BAG | | 8 | | |
| B-5 | 12 | 4030-00-291-9354 | STAKE, GUY GP-112 | (80058) | INSIDE GUY STAKE BAG | | 6 | | |
| B-5 | 13 | 3950-00-973-0258 | WINCH ASSEMBLY SM-C-423630 | (80063) | INSIDE ACCESSORY BAG | | 2 | | |
| B-5 | 14 | 5985-00-933-5481 | SUPPORT, ANTENNA AB-957/GRC-50 SC-DL-547064 | (80063) | INSIDE ACCESSORY BAG | | 2 | | |
| B-5 | 15 | 5820-00-064-5452 | REEL, CABLE RC-436/GRC | (80058) | FLOOR | | 2 | | |
| B-5 | 16 | 5935-00-064-5561 | ADAPTER, CONNECTOR UG-1373/U | (80058) | MTD ON RC-436/GRC | | 2 | | |
| B-5 | 17 | 5935-00-892-8878 | ADAPTER, CONNECTOR UG-1374 | (80058) | MTD ON RC-436/GRC | | 4 | | |
| B-5 | 18 | 5995-00-889-0854 | CABLE ASSEMBLY, RADIO FREQUENCY, 40 FT. CG-1859/U | (80058) | MTD ON RC-436/GRC | | 2 | | |
| B-5 | 19 | 5995-00-889-0527 | CABLE ASSEMBLY, RADIO FREQUENCY, 80 FT. CG-1859/U | (80058) | MTD ON RC-436/GRC | | 2 | | |
| B-5 | 20 | 5120-00-892-4713 | BAR, DIGGING SM-B-423624 | (80063) | INSIDE GUY STAKE BAG | | 2 | | |
| B-5 | 21 | 5820-00-973-0352 | MAST COUPLER TOOL SM-B-423604 | (80063) | INSIDE ACCESSORY BAG | | 2 | | |
| B-5 | 22 | 5820-00-973-0350 | CARRIER ASSEMBLY (MAST SECTION CARRIER) SM-D-423552 | (80063) | INSIDE ACCESSORY BAG | | 2 | | |
| B-5 | 23 | 5840-00-973-0230 | CLAMP, RIM CLENCHING (MAST SECTION COUPLERS) SM-C-423646 | (80063) | INSIDE ACCESSORY BAG | | 16 | | |
| B-5 | 24 | 5975-00-714-8834 | GUY ASSEMBLY (39-FEET) SM-D-423651 | (80063) | INSIDE ACCESSORY BAG | | 6 | | |
| B-5 | 25 | 5975-00-714-8834 | GUY ASSEMBLY (47-FEET) SM-D-423650 | (80063) | INSIDE ACCESSORY BAG | | 6 | | |
| B-5 | 26 | 5975-00-715-7932 | GUY ASSEMBLY (65-FEET) SM-D-423629 | (80063) | INSIDE ACCESSORY BAG | | 6 | | |

SECTION II, INTEGRAL COMPONENTS OF END ITEM

| I ILLUSTRATION | | 2 NATIONAL STOCK NUMBER | (3) DESCRIPTION PART NUMBER (FSCM) | (4) LOCATION | (5) USABLE ON CODE | (6) QTY REQD | (7) QUANTITY | |
|-------------------|------------------|----------------------------------|--|----------------------|-----------------------------|--------------------|-----------------|------|
| A FIG NO. | B ITEM NO. | | | | | | RCVD | DATE |
| B-5 | 27 | 4030-00-973-0189 | TOP GUY RING ASSEMBLY SM-C-423561 (80063) | INSIDE ACCESSORY BAG | | 2 | | |
| B-5 | 28 | 4030-00-973-0188 | MIDDLE GUY RING ASSEMBLY SM-D-423560 (80063) | INSIDE ACCESSORY BAG | | 2 | | |
| B-5 | 29 | 5820-00-973-0298 | HALYARD, ANTENNA (RADIUS ROPE) SM-B-423575 (80063) | INSIDE ACCESSORY BAG | | 2 | | |
| B-5 | 30 | 5120-00-265-7462 | HAMMER, 6-LB. GGG-H-86 (81348) | INSIDE GUY STAKE BAG | | 2 | | |
| B-5 | 31 | 7220-00-753-2982 | MATTING, FLOOR, RUBBER (36 IN. X 113 IN.) SC-C-539500-4 (81348) | FLOOR | | 1 | | |
| B-5 | 32 | 5410-00-752-2435 | CABLE ASSEMBLY, POWER, 100 FT. CX-7453A/U (80058) | MTD ON RC-435/U | | 1 | | |
| B-5 | 33 | 5995-00-935-2686 | CABLE ASSEMBLY, POWER, ELECTRICAL 15 FT. STUB CX-7705A/U (80058) | MTD ON RC-435/U | | 1 | | |

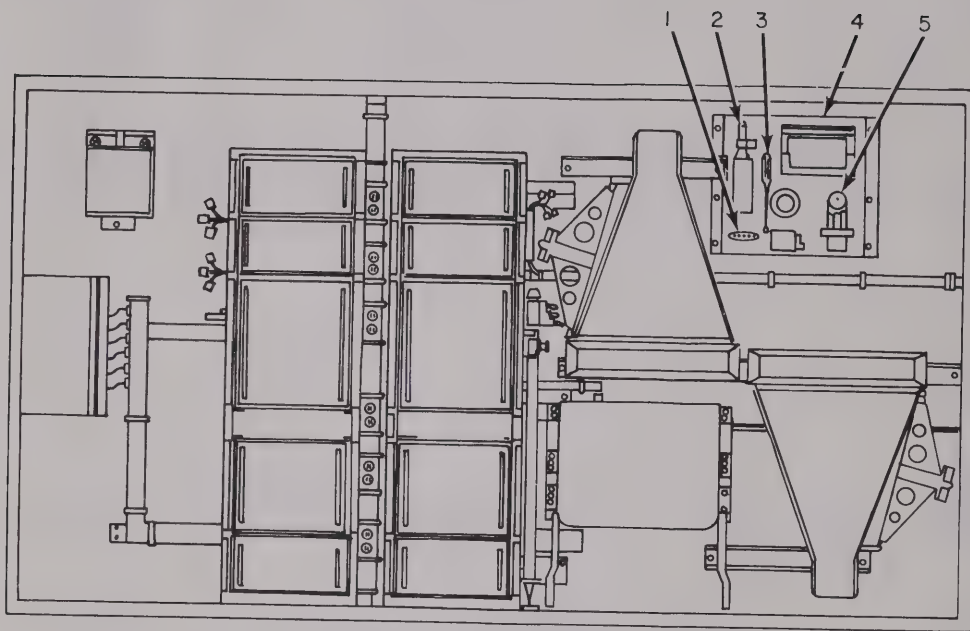


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Figure B-6. Radio Terminal Set AN/TRC-117(), ceiling plan, integral components.*

SECTION II INTEGRAL COMPONENTS OF END ITEM

| (1) ILLUSTRATION | | (2) NATIONAL STOCK NUMBER | (3) DESCRIPTION PART NUMBER (FSCM) | (4) LOCATION | (5) USABLE ON CODE | (6) QTY REQD | (7) QUANTITY | |
|---------------------|--------------------|------------------------------------|--|-----------------|-----------------------------|--------------------|-----------------|------|
| (A) FIG NO. | (B) ITEM NO. | | | | | | RCVD | DATE |
| B-6 | 1 | 6240-00-152-2996 | LAMP, FLUORESCENT F20T12/CW (24455) | CEILING | | 6 | | |



EL3TT073

Figure B-7. Radio Terminal Set AN/TRC-117(*), interior roadside wall, basic issue items.

SECTION III BASIC ISSUE ITEMS

| (1) ILLUSTRATION | | (2) NATIONAL STOCK NUMBER | (3) DESCRIPTION | | (4) LOCATION | (5) USABLE ON CODE | (6) QTY REQD | (7) QUANTITY | |
|---------------------|--------------------|------------------------------------|--|---------|--------------------|-----------------------------|--------------------|-----------------|------|
| (A) FIG NO. | (B) ITEM NO. | | PART NUMBER | (FSCM) | | | | RCVD | DATE |
| B-7 | 1 | 5120-00-293-3603 | STRAIGHTENER, PIN, ELECTRON TUBE (7 PIN/9 PIN) 666-P-00340 | (81348) | COMMON ITEMS PANEL | | 1 | | |
| B-7 | 2 | 7920-00-178-8315 | BRUSH, DUSTING, HAND SC-C-539469 | (80063) | COMMON ITEMS PANEL | | 1 | | |
| B-7 | 3 | 5120-00-234-8910 | SCREWDRIVER (FLAT BLADE) GGG-S-121 | (80063) | COMMON ITEMS PANEL | | 1 | | |
| B-7 | 4 | 6545-00-922-1200 | KIT, FIRST AID SC-C-549483 | (80063) | COMMON ITEMS PANEL | | 1 | | |
| B-7 | 5 | 6230-00-729-9614 | LANTERN SC-C-539491 | (80063) | COMMON ITEMS PANEL | | 1 | | |

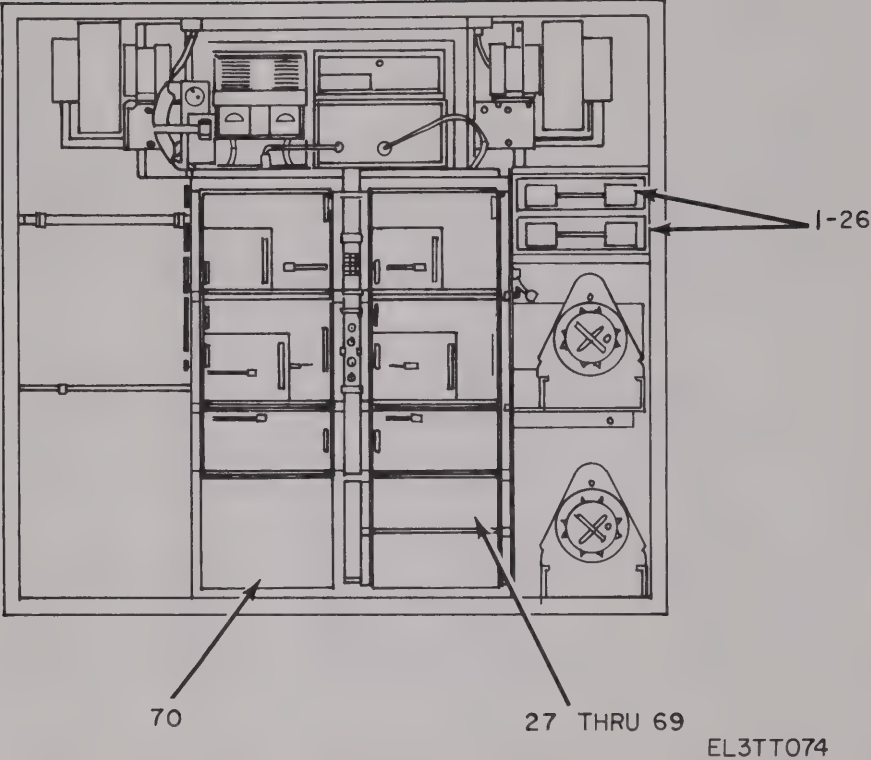


Figure B-8. Radio Terminal Set AN/TRC-117(*), interior front wall, basic issue items.

SECTION III BASIC ISSUE ITEMS

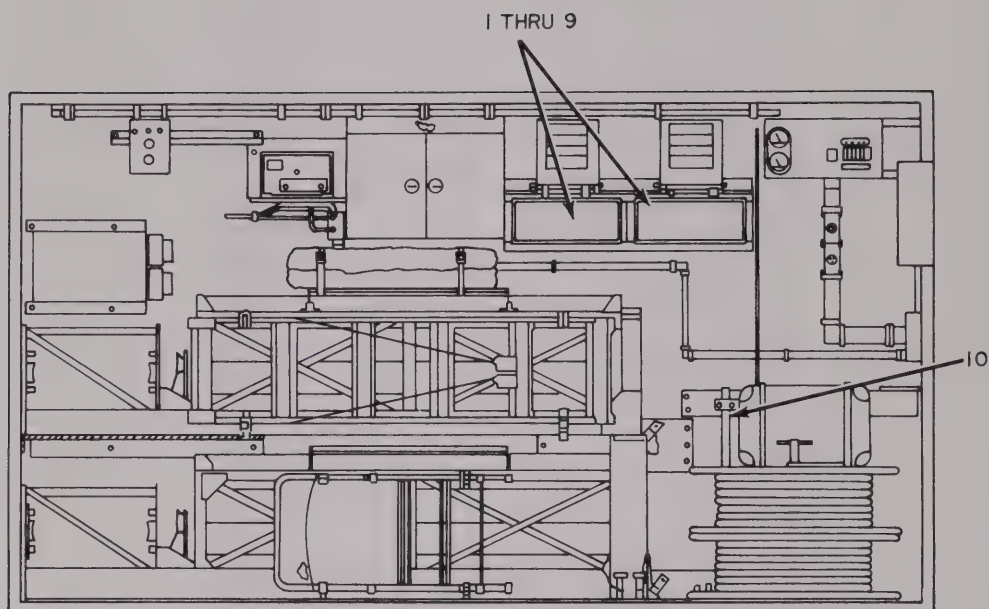
| (1) ILLUSTRATION | | (2) NATIONAL STOCK NUMBER | (3) DESCRIPTION PART NUMBER (FSCM) | (4) LOCATION | (5) USABLE ON CODE | (6) QTY REQD | (7) QUANTITY | |
|---------------------|--------------------|------------------------------------|---|--|-----------------------------|--------------------|-----------------|------|
| (A) FIG NO. | (B) ITEM NO. | | | | | | RCVD | DATE |
| B-8 | 1 | 5820-00-064-5450 | CASE, STANDARDIZED COMPONENTS, ELECTRICAL; COMPLETE WITH RUNNING SPARES CY-2583/GRC (80058) WHICH INCLUDES, DIVIDED BETWEEN BOTH CASES: | FRONT WALL RADIO SPARES COMPARTMENT | | 2 | | |
| B-8 | 2 | 5120-00-788-1623 | EXTRACTING TOOL (FOR TUBE, ELECTRON, TYPE 7289) SC-B-423155 (80063) | CY-2583/GRC | | 1 | | |
| B-8 | 3 | 5120-00-293-0808 | PULLER, TUBE TL-201() (80063) | CY-2583/GRC | | 1 | | |
| B-8 | 4 | 5120-00-293-2696 | PULLER, TUBE, 7 PIN MINIATURE, ECONOMY 7113 (80063) | CY-2583/GRC | | 1 | | |
| B-8 | 5 | 5120-00-508-0584 | PULLER, TUBE, 9 PIN MINIATURE, ECONOMY 9113 (80063) | CY-2583/GRC | | 1 | | |
| B-8 | 6 | 5960-00-624-4718 | TUBE, ELECTRON 6627/0B2WA (81349) | CY-2583/GRC | | 3 | | |
| B-8 | 7 | 5960-00-815-0813 | TUBE, ELECTRON 7289 (81349) | CY-2582/GRC | | 3 | | |
| B-8 | 8 | 5960-00-217-0361 | TUBE, ELECTRON 6A46WA (81349) | CY-2583/GRC | | 1 | | |
| B-8 | 9 | 5960-00-543-0219 | TUBE, ELECTRON 6A45WA (81349) | CY-2583/GRC | | 1 | | |
| B-8 | 10 | 5960-00-262-0167 | TUBE, ELECTRON 12A7WA (81349) | CY-2583/GRC | | 1 | | |
| B-8 | 11 | 5960-00-262-1357 | TUBE, ELECTRON 5654/6AK5W (81349) | CY-2583/GRC | | 2 | | |
| B-8 | 12 | 5960-00-188-6584 | TUBE, ELECTRON 5670 (81349) | CY-2583/GRC | | 5 | | |
| B-8 | 13 | 5960-00-577-3078 | TUBE, ELECTRON 5687WA (81349) | CY-2583/GRC | | 1 | | |
| B-8 | 14 | 5960-00-820-8717 | TUBE, ELECTRON 6688 (81349) | CY-2583/GRC | | 2 | | |
| B-8 | 15 | 5960-00-193-5145 | TUBE, ELECTRON 5751 (81349) | CY-2583/GRC | | 2 | | |
| B-8 | 16 | 5960-00-247-8748 | TUBE, ELECTRON 5842 (81349) | CY-2583/GRC | | 1 | | |
| B-8 | 17 | 5960-00-542-7182 | TUBE, ELECTRON 6080WB (81349) | CY-2583/GRC | | 2 | | |
| B-8 | 18 | 5960-00-808-4212 | TUBE, ELECTRON 6146 (81349) | CY-2583/GRC | | 1 | | |
| B-8 | 19 | 5960-00-237-6917 | TUBE, ELECTRON 5725/6AS6W (81349) | CY-2583/GRC | | 1 | | |
| B-8 | 20 | 5960-00-884-1983 | TUBE, ELECTRON 4037A (RCA) (81349) | CY-2583/GRC | | 4 | | |
| B-8 | 21 | 5961-00-615-4309 | SEMICONDUCTOR DEVICE, DIODE 1N23WE (81349) | CY-2583/GRC | | 2 | | |
| B-8 | 22 | 5965-00-064-5435 | HOLDER, HANDSET MT-216()/U (80058) | CY-2583/GRC | | 1 | | |
| B-8 | 23 | 5960-00-615-5550 | SEMICONDUCTOR DEVICE, DIODE 1N21WE (81349) | CY-2583/GRC | | 5 | | |
| B-8 | 24 | 5920-00-892-9039 | ARRESTOR, LIGHTENING, CARBON BLOCK TYPE SM-B-423080 (80063) | CY-2583/GRC | | 5 | | |
| B-8 | 25 | 5920-00-681-0918 | FUSE, CARTRIDGE F02B125V3A (80063) | CY-2583/GRC | | 5 | | |

SECTION III BASIC ISSUE ITEMS

| (1) ILLUSTRATION | | (2) NATIONAL STOCK NUMBER | (3) DESCRIPTION | | (4) LOCATION | (5) USABLE ON CODE | (6) QTY REQD | (7) QUANTITY | |
|---------------------|--------------------|------------------------------------|---|---------|--------------------------------|-----------------------------|--------------------|-----------------|------|
| (A) FIG NO. | (B) ITEM NO. | | PART NUMBER | (FSCM) | | | | RCVD | DATE |
| B-8 | 26 | 5920-00-284-6796 | FUSE, CARTRIDGE F03B32V 5A | (80063) | CY-2583/GRC | | 5 | | |
| B-8 | 27 | 5805-00-926-2627 | CASE, ELECTRONIC EQUIPMENT MAINTENANCE KIT: MARKED ON COVER "TD-352/U SPARES" CY-6097/U WHICH INCLUDES: | (80058) | FRONT WALL SPARE PARTS CASE | | 1 | | |
| B-8 | 28 | 5805-00-944-8146 | PANEL ASSEMBLY, 1A2/2A2 SM-D-526536 | (80063) | FRONT WALL SPARE PARTS CASE | | 1 | | |
| B-8 | 29 | 5805-00-944-8942 | PANEL ASSEMBLY, 1A3/2A2 SM-D-526539 | (80063) | FRONT WALL SPARE PARTS CASE | | 1 | | |
| B-8 | 30 | 5805-00-944-8144 | PANEL ASSEMBLY, 2A5 SM-D-526557 | (80063) | FRONT WALL SPARE PARTS CASE | | 1 | | |
| B-8 | 31 | 5805-00-945-1182 | PANEL ASSEMBLY, 1A6/2A6 SM-D-526545 | (80063) | FRONT WALL SPARE PARTS CASE | | 1 | | |
| B-8 | 32 | 5805-00-945-1180 | PANEL ASSEMBLY, 2A7 SM-D-526560 | (80063) | FRONT WALL SPARE PARTS CASE | | 1 | | |
| B-8 | 33 | 5805-00-945-3824 | PANEL ASSEMBLY, 2A8 SM-D-526563 | (80063) | FRONT WALL SPARE PARTS CASE | | 1 | | |
| B-8 | 34 | 5805-00-916-5963 | PANEL ASSEMBLY, 2A9 SM-D-526566 | (80063) | FRONT WALL SPARE PARTS CASE | | 1 | | |
| B-8 | 35 | 5805-00-945-1094 | PANEL ASSEMBLY, 2A10 SM-D-526569 | (80063) | FRONT WALL SPARE PARTS CASE | | 1 | | |
| B-8 | 36 | 5805-00-945-1130 | PANEL ASSEMBLY, 1A12/2A12 SM-D-526551 | (80063) | FRONT WALL SPARE PARTS CASE | | 1 | | |
| B-8 | 37 | 5805-00-944-8874 | PANEL ASSEMBLY, 2A13 SM-D-526572 | (80063) | FRONT WALL SPARE PARTS CASE | | 1 | | |
| B-8 | 38 | 5805-00-945-1121 | PANEL ASSEMBLY, 1A14/2A14 SM-D-526554 | (80063) | FRONT WALL SPARE PARTS CASE | | 1 | | |
| B-8 | 39 | 5805-00-944-8885 | PANEL ASSEMBLY, 2A15 SM-D-526575 | (80063) | FRONT WALL SPARE PARTS CASE | | 1 | | |
| B-8 | 40 | 5805-00-974-9946 | PANEL ASSEMBLY, 2A16/2A16 SM-D-526584 | (80063) | FRONT WALL SPARE PARTS CASE | | 1 | | |
| B-8 | 41 | 5805-00-926-2627 | CASE, ELECTRONIC EQUIPMENT, MAINTENANCE KIT: MARKED ON COVER "TD-202/204 SPARES" CY-6097/U WHICH INCLUDES: | (80058) | FRONT WALL SPARE PARTS CASE | | 1 | | |
| B-8 | 42 | 5805-00-945-1021 | PANEL ASSEMBLY, 5A2 SM-D-527010 | (80063) | FRONT WALL SPARE PARTS CASE | | 1 | | |
| B-8 | 43 | 5805-00-945-1186 | PANEL ASSEMBLY, 5A3 SM-D-529513 | (80063) | FRONT WALL SPARE PARTS CASE | | 1 | | |
| B-8 | 44 | 5805-00-945-3825 | PANEL ASSEMBLY, 5A4 SM-D-529516 | (80063) | FRONT WALL SPARE PARTS CASE | | 1 | | |
| B-8 | 45 | 5805-00-945-1185 | PANEL ASSEMBLY, 5A5 SM-D-529519 | (80063) | FRONT WALL SPARE PARTS CASE | | 1 | | |
| B-8 | 46 | 5805-00-945-1020 | PANEL ASSEMBLY, 4A6/5A6 SM-D-527022 | (80063) | FRONT WALL SPARE PARTS CASE | | 1 | | |
| B-8 | 47 | 5805-00-1019 | PANEL ASSEMBLY, 4A7/5A7 SM-D-529507 | (80063) | FRONT WALL SPARE PARTS CASE | | 1 | | |
| B-8 | 48 | 5805-00-945-1207 | PANEL ASSEMBLY, 4A8/5A8 SM-D-529510 | (80063) | FRONT WALL SPARE PARTS CASE | | 1 | | |
| B-8 | 49 | 5805-00-944-8142 | PANEL ASSEMBLY, 6A2 SM-D-527522 | (80063) | FRONT WALL SPARE PARTS CASE | | 1 | | |
| B-8 | 50 | 5805-00-944-8932 | PANEL ASSEMBLY, 6A3 SM-D-527525 | (80063) | FRONT WALL SPARE PARTS CASE | | 1 | | |
| B-8 | 51 | 5805-00-926-0264 | PANEL ASSEMBLY, 6A4 SM-D-527537 | (80063) | FRONT WALL SPARE PARTS CASE | | 1 | | |

SECTION III BASIC ISSUE ITEMS

| (1) ILLUSTRATION | | (2) NATIONAL STOCK NUMBER | (3) DESCRIPTION | | (4) LOCATION | (5) USABLE ON CODE | (6) QTY REQD | (7) QUANTITY | |
|---------------------|------------------|------------------------------------|---|---------|--------------------------------|-----------------------------|--------------------|-----------------|------|
| A FIG NO. | B ITEM NO. | | PART NUMBER | (FSCM) | | | | RCVD | DATE |
| B-8 | 52 | 5805-00-944-8159 | PANEL ASSEMBLY, 6A5 SM-D-527528 | (80063) | FRONT WALL SPARE PARTS CASE | | 1 | | |
| B-8 | 53 | 5805-00-944-8153 | PANEL ASSEMBLY, 6A6 SM-D-527531 | (80063) | FRONT WALL SPARE PARTS CASE | | 1 | | |
| B-8 | 54 | 5805-00-944-8401 | PANEL ASSEMBLY, 6A7 SM-D-527534 | (80063) | FRONT WALL SPARE PARTS CASE | | 1 | | |
| B-8 | 55 | 5805-00-929-3587 | PANEL ASSEMBLY, SPARE FUSE AND LAMP ONE (1) LOCATED IN EACH CY-6097/U SC-DL-529124 WHICH INCLUDES: | (80063) | FRONT WALL SPARE PARTS CASE | | 2 | | |
| B-8 | 56 | 5920-00-043-2641 | FUSE, CARTRIDGE; 1/4 AMP, 250V FO2A250V 1/4A | (81349) | FRONT WALL SPARE PARTS CASE | | 3 | | |
| B-8 | 57 | 5920-00-280-8344 | FUSE, CARTRIDGE; 1/2 AMP, 250V FO2A250V 1/2A | (81349) | FRONT WALL SPARE PARTS CASE | | 1 | | |
| B-8 | 58 | 5920-00-296-0446 | FUSE, CARTRIDGE; 3/4 AMP, 250V FO2A250V 3/4A | (81349) | FRONT WALL SPARE PARTS CASE | | 3 | | |
| B-8 | 59 | 5920-00-280-8342 | FUSE, CARTRIDGE; 1 AMP, 250V FO2A250V 1A | (81349) | FRONT WALL SPARE PARTS CASE | | 2 | | |
| B-8 | 60 | 5920-00-280-4960 | FUSE, CARTRIDGE; 2 AMP, 250V FO2A250V 2A | (81349) | FRONT WALL SPARE PARTS CASE | | 4 | | |
| B-8 | 61 | 5920-00-010-6652 | FUSE, CARTRIDGE; 3 AMP, 250V FO2A250V 3A | (81349) | FRONT WALL SPARE PARTS CASE | | 4 | | |
| B-8 | 62 | 5920-00-284-6787 | FUSE, CARTRIDGE; 5 AMP, 250V FO2A250V 5A | (81349) | FRONT WALL SPARE PARTS CASE | | 1 | | |
| B-8 | 63 | 5120-00-198-5401 | KEY, SOCKETHEAD SCREW; 0.050-IN HEX ALLEN TYPE SM-B-529134-1 | (80063) | FRONT WALL SPARE PARTS CASE | | 1 | | |
| B-8 | 64 | 5120-00-224-2504 | KEY, SOCKETHEAD SCREW; 5/64-IN. HEX ALLEN TYPE SM-R-529134-2 | (80063) | FRONT WALL SPARE PARTS CASE | | 1 | | |
| B-8 | 65 | 6240-00-155-7836 | LAMP, INCANDESCENT, 28V, 0.004 AMP MS25237-327 | (81349) | FRONT WALL SPARE PARTS CASE | | 5 | | |
| B-8 | 66 | 6240-00-155-7857 | LAMP, INCANDESCENT, 6V, 0.200 AMP (NOT USED) MS25237-328 | (81349) | FRONT WALL SPARE PARTS CASE | | 1 | | |
| B-8 | 67 | 6240-00-892-4420 | LAMP, GLOW, C7A (FORMERLY NE20) MS15098/11-001 | (81349) | FRONT WALL SPARE PARTS CASE | | 2 | | |
| B-8 | 68 | 5805-00-930-4838 | PANEL, 18A2, 20 HZ AND 1600 HZ GENERATORS SM-D-528511 | (80063) | FRONT WALL SPARE PARTS CASE | | 1 | | |
| B-8 | 69 | 5805-00-926-3251 | PANEL, ELECTRONIC COMPONENT, 18A3B SM-E-528712 | (80063) | FRONT WALL SPARE PARTS CASE | | 1 | | |
| B-8 | 70 | 7190-00-900-1678 | CLEANER, VACUUM 2800 | (29335) | UNDER FRONT WALLRACK | | 1 | | |

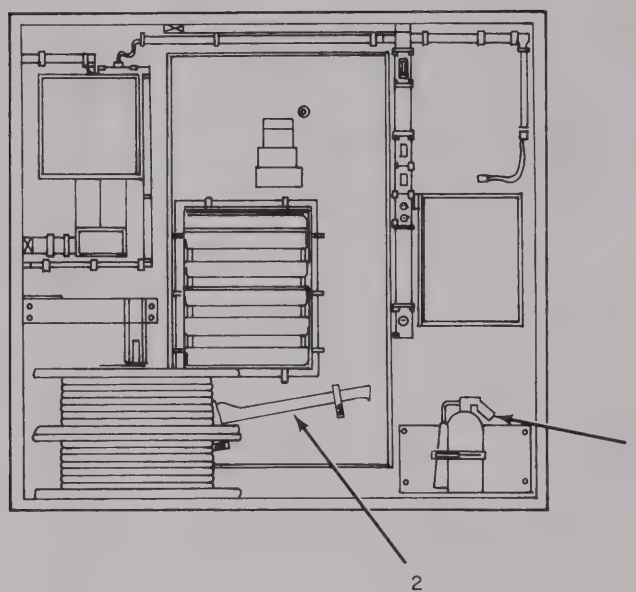


EL3TT075

Figure B-9. Radio Terminal Set AN/TRC-117(*), interior curbside wall, basic issue items.

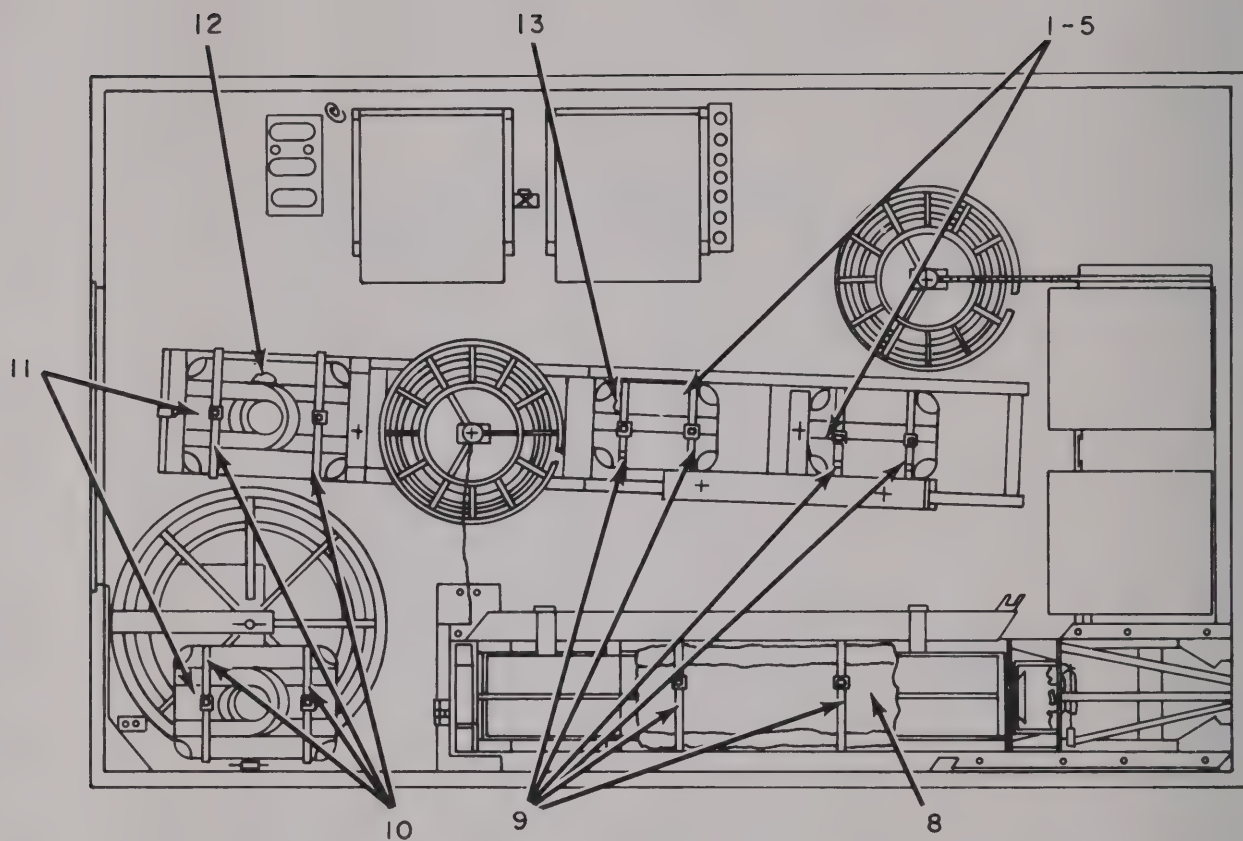
SECTION III BASIC ISSUE ITEMS

| (1) ILLUSTRATION | | (2) NATIONAL STOCK NUMBER | (3) DESCRIPTION PART NUMBER (FSCM) | (4) LOCATION | (5) USABLE ON CODE | (6) QTY REQD | (7) QUANTITY | |
|---------------------|--------------------|------------------------------------|--|-----------------|-----------------------------|--------------------|-----------------|------|
| (A) FIG NO. | (B) ITEM NO. | | | | | | RCVD | DATE |
| B-9 | 1 | 9920-00-682-6757 | TRAY, ASH AA-A710 TYPE III STYLE A (81349) | SPARE CASE | | 1 | | |
| B-9 | 2 | | TECHNICAL MANUAL TM-11-5895-366-14-2 | SPARE CASE | | 1 | | |
| B-9 | 3 | 6240-00-635-9753 | LAMP, GLOW R2A (FORMERLY NE-34) M15098/3-002 (81349) | SPARE CASE | | 2 | | |
| B-9 | 4 | 6240-00-682-3411 | LAMP, GLOW, B1A (FORMERLY NE-51) (POWER DISTRIBUTION BOX) MIL-15098/10-001 | SPARE CASE | | 3 | | |
| B-9 | 5 | 6240-00-143-3070 | LAMP, INCANDESCENT 50W 50W/RS (81349) | SPARE CASE | | 6 | | |
| B-9 | 6 | 6240-00-155-8653 | LAMP, INCANDESCENT 25W 25T8DC (81349) | SPARE CASE | | 4 | | |
| B-9 | 7 | 6230-00-239-3518 | LIGHT, EXTENSION (25 FT.) SC-C-539496 (80063) | SPARE CASE | | 1 | | |
| B-9 | 8 | 5340-00-682-1508 | PADLOCK MIL-P-17802 (81349) | SPARE CASE | | 1 | | |
| B-9 | 9 | 5410-00-805-5533 | SLING ASSEMBLY, MULTIPLE-LEG SC-D-36423 (80063) | SPARE CASE | | 1 | | |
| B-9 | 10 | 5120-00-251-4489 | HAMMER, SLEDGE (81B.) SC-C-539505 (80063) | CURBSIDE WALL | | 1 | | |



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Figure B-10. Radio Terminal Set AN/TRC-117(*), interior entrance wall, basic issue items.

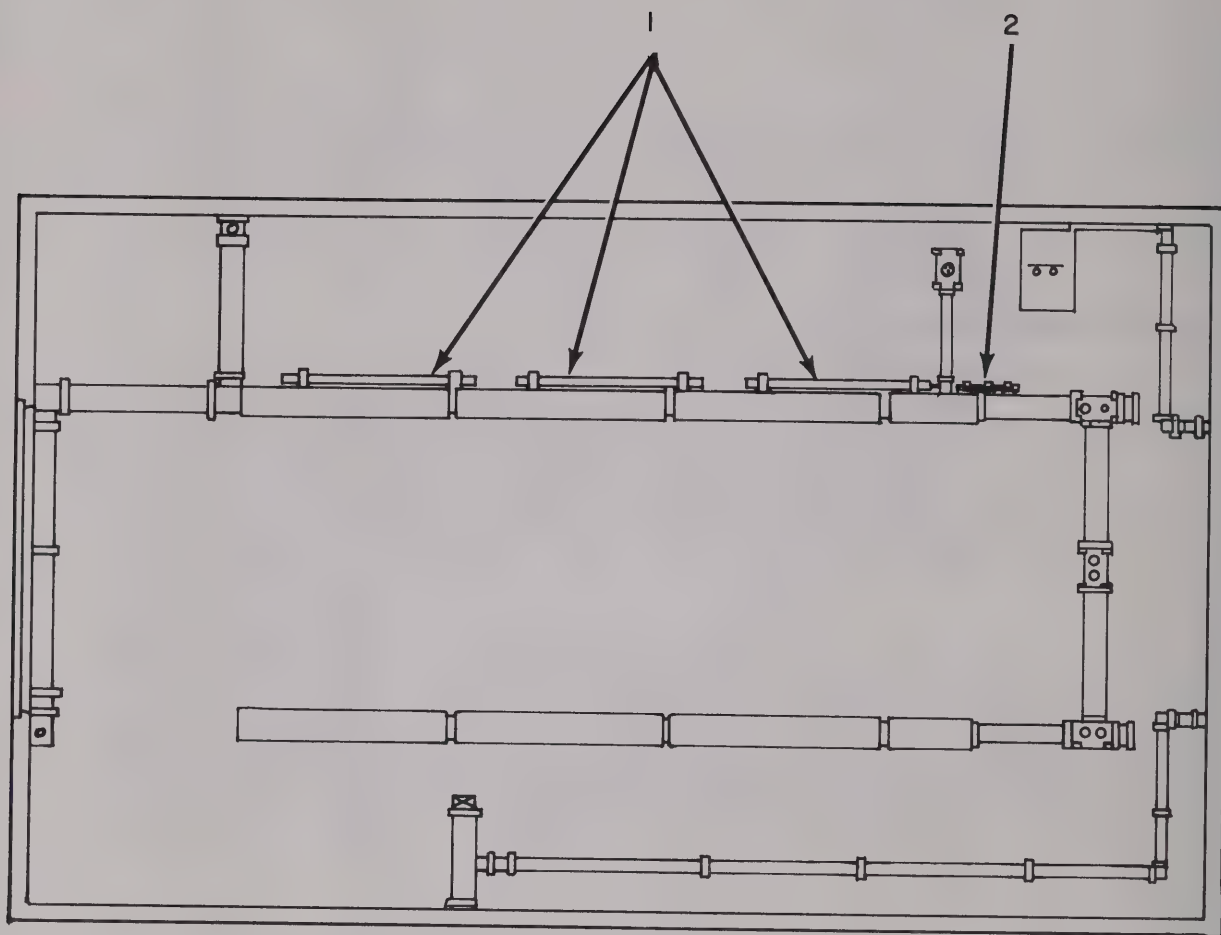


EL3TT077

Figure B-11. Radio Terminal Set AN/TRC-117(*), floor plan, basic issue items.

SECTION III BASIC ISSUE ITEMS

| (1) ILLUSTRATION | | (2) NATIONAL STOCK NUMBER | (3) DESCRIPTION | | (4) LOCATION | (5) USABLE ON CODE | (6) QTY REQD | (7) QUANTITY | |
|---------------------|--------------------|------------------------------------|---|---------|-----------------|-----------------------------|--------------------|-----------------|------|
| (A) FIG NO. | (B) ITEM NO. | | PART NUMBER | (FSCM) | | | | RCVD | DATE |
| B-11 | 1 | 8105-00-497-9628 | BAG BG-102A | (80063) | ON FLOOR | | 2 | | |
| B-11 | 2 | 2530-00-287-2564 | SCREWDRIVER, 3-IN. BLADE GGG-S-121 | (81349) | INSIDE BG-102A | | 1 | | |
| B-11 | 3 | 5120-00-222-8852 | SCREWDRIVER, 4-IN. BLADE GGG-S-121 | (81349) | INSIDE BG-102A | | 1 | | |
| B-11 | 4 | 6625-00-889-1583 | TEST LEAD, BLACK SM-C-422237 | (80063) | INSIDE BG-102A | | 1 | | |
| B-11 | 5 | 6625-00-965-0498 | TEST LEAD, RED SM-C-422263 | (80063) | INSIDE BG-102A | | 1 | | |
| B-11 | 6 | 5120-00-224-2596 | WRENCH, SOCKET, SPIN TYPE, 5/16 IN. SC-C-681041 | (80063) | INSIDE BG-102A | | 1 | | |
| B-11 | 7 | 5120-00-449-8083 | WRENCH, OPEN END, ADJUSTABLE, 10 IN. GGG-W-631, TYPE CLASS I | (81349) | INSIDE BG-102A | | 1 | | |
| B-11 | 8 | 5140-00-973-0491 | ROLL (STAKE ROLL) SM-D-423619 | (80063) | ON TOP OF MAST | | 1 | | |
| B-11 | 9 | 5340-00-016-5776 | STRAP ASSEMBLY, TIE DOWN: 48 IN. SC-B-547271 GR 3 | (80063) | AROUND BAGS | | 6 | | |
| B-11 | 10 | 5340-00-016-5669 | STRAP ASSEMBLY, TIE DOWN: 54 IN. SC-B-547271 GR 4 | (80063) | AROUND BAGS | | 4 | | |
| B-11 | 11 | 5820-00-973-0349 | BAG, COTTON DUCK SM-C-423628 | (80063) | ON FLOOR | | 2 | | |
| B-11 | 12 | 5340-00-016-5716 | STRAP ASSEMBLY, TIE DOWN: 68 IN. SC-B-547271 GR 5 | (80063) | INSIDE BG-102A | | 4 | | |
| B-11 | 13 | 5340-00-016-5576 | STRAP ASSEMBLY, TIE DOWN: 24 IN. SC-B-547271 GR 1 | (80063) | INSIDE BG-102A | | 12 | | |



EL3TT078

Figure B-12. Radio Terminal Set AN/TRC-117(*), ceiling plan, basic issue items.

SECTION III BASIC ISSUE ITEMS

| (1) ILLUSTRATION | | (2) NATIONAL STOCK NUMBER | (3) DESCRIPTION PART NUMBER (FSCM) | (4) LOCATION | (5) USABLE ON CODE | (6) QTY REQD | (7) QUANTITY | |
|---------------------|--------------------|------------------------------------|--|-----------------|-----------------------------|--------------------|-----------------|------|
| (A) FIG NO. | (B) ITEM NO. | | | | | | RCVD | DATE |
| B-12 | 1 | 6240-00-152-2996 | LAMP, FLUORESCENT, 20W SC-C-539495 (24455) | CEILING | | 3 | | |
| B-12 | 2 | 6250-00-194-4794 | STARTER, FLUORESCENT LAMP SC-B-539504 (80063) | CEILING | | 3 | | |

APPENDIX C

ADDITIONAL AUTHORIZATION LIST

Section I. INTRODUCTION

C-1. Scope

This appendix lists additional items you are authorized for the support of the AN/TRC-117(*).

C-2. General

This list identifies items that do not have to accompany the AN/TRC-117(*) and that do not have to be

turned in with it. These items are all authorized to you by CTA, MTOE, TDA, or JTA.

C-3. Explanation of Listing

National stock numbers, descriptions, and quantities are provided to help you identify and request the additional items you require to support this equipment.

SECTION II ADDITIONAL AUTHORIZATION LIST

| (1) NATIONAL STOCK NUMBER | (2) DESCRIPTION PART NUMBER AND FSCM USABLE ON CODE | (3) UNIT OF MEAS | (4) QTY AUTH |
|------------------------------------|--|---------------------------|--------------------|
| 6135-00-120-1020 | BATTERY, BA30 | EA | 4 |
| 6115-00-738-6337 | GENERATOR SET, GASOLINE ENGINE, TRAILER MOUNTED PU-618/M | EA | 1 |
| 5810-00-054-9110 | COMMUNICATIONS SECURITY EQUIPMENT TSEC/KG-27 | EA | 2 |
| 5810-00-138-2328 | KIT INSTALLATION FOR TSEC/KG-27 | EA | 2 |
| 5810-00-177-4674 | LOOPBACK KIT FOR TSEC/KG-27, TAD-SK-7195C | EA | 1 |
| 6135-00-850-3177 | BATTERY, 9V, DRY SNAP-ON-TERMINAL (FOR CLOCK) (2 MNG) | EA | 1 |
| | OR | | |
| | BATTERY, DRY, 15V, "AA" SIZE MALLORY ZM-9, EVEREADY E-9 OR EQUIVALENT | EA | 1 |
| 5340-00-285-6523 | PADLOCK, CHANGEABLE COMBINATION (USED TO LOCK SHELTER WITH TSEC/KG-27 EQUIPMENT) | EA | 1 |

APPENDIX D

MAINTENANCE ALLOCATION CHART

Section I. INTRODUCTION

D-1. General

a. This section provides a general explanation of all maintenance and repair functions authorized at various maintenance levels.

b. The Maintenance Allocation Chart (MAC) in Section II designates overall responsibility for the performance of maintenance functions on the identified end item or component. The implementation of the maintenance functions upon the end item or component will be consistent with the assigned maintenance functions.

c. Section III lists the special tools and test equipment required for each maintenance function as referenced in Section II.

d. Section IV contains supplemental instructions on explanatory notes for a particular maintenance function.

D-2. Maintenance Functions

a. *Inspect.* To determine the serviceability of an item by comparing its physical, mechanical, and/or electrical characteristics with established standards through examination.

b. *Test.* To verify serviceability and detect incipient failure by measuring the mechanical or electrical characteristics of an item and comparing those characteristics with prescribed standards.

c. *Service.* Operations required periodically to keep an item in proper operating condition, i.e., to clean (decontaminate), to preserve, to drain, to paint, or to replenish fuel, lubricants, hydraulic fluids, or compressed air supplies.

d. *Adjust.* To maintain within prescribed limits by bringing into proper or exact position, or by setting the operating characteristics to specified parameters.

e. *Align.* To adjust specified variable elements of an item to bring about optimum or desired performance.

f. *Calibrate.* To determine and cause corrections to be made or to be adjusted on instruments or test measuring and diagnostic equipment used in precision measurement. Consists of comparisons of two instruments, one of which is a certified standard of

known accuracy to detect and adjust any discrepancy in the accuracy of the instrument being compared.

g. *Install.* The act of emplacing, seating, or fixing into position an item, part, or module (component or assembly) in a manner to allow the proper functioning of the equipment/system.

h. *Replace.* The act of substituting a serviceable like-type part, subassembly, or module (component or assembly) for an unserviceable counterpart.

i. *Repair.* The application of maintenance services or other maintenance actions to restore serviceability to an item by correcting specific damage, fault, malfunction, or failure in a part, subassembly, module (component or assembly), end item, or system.

j. *Overhaul.* That maintenance effort (services/actions) necessary to restore an item to a completely serviceable/operational condition as prescribed by maintenance standards (i.e. DMWR) in appropriate technical publications. Overhaul is normally the highest degree of maintenance performed by the Army. Overhaul does not normally return an item to like new condition.

k. *Rebuild.* Consists of those services/actions necessary for the restoration of unserviceable equipment to a like-new condition in accordance with original manufacturing standards. Rebuild is the highest degree of material maintenance applied to Army equipment. The rebuild operation includes the act of returning to zero those age measurements (hours/miles, etc.) considered in classifying Army equipment/components.

D-3. Column Entries Used in the MAC

a. *Column 1, Group Number.* Column 1 lists group numbers, the purpose of which is to identify components, assemblies, subassemblies, and modules with the next higher assembly.

b. *Column 2, Component/Assembly.* Column 2 contains the names of components, assemblies, subassemblies, and modules for which maintenance is authorized.

c. Column 3, Maintenance Functions. Column 3 lists the functions to be performed on the item listed in column 2. (For detailed explanation of these functions, see para D-2.)

d. Column 4, Maintenance Level. Column 4 specifies, by the listing of a "work time" figure in the appropriate subcolumn(s), the lowest level of maintenance authorized to perform the function listed in column 3. This figure represents the active time required to perform the maintenance function at the indicated level of maintenance. If the number or complexity of the tasks within the listed maintenance function vary at different maintenance levels, appropriate "work time" figures will be shown for each level. The number of manhours specified by the "work time" figure represents the average time required to restore an item (assembly, subassembly, component, module, end item, or system) to a serviceable condition under typical field operating conditions. This time includes preparation time, troubleshooting time, and quality assurance/quality control time in addition to the time required to perform the specific tasks identified for the maintenance functions authorized in the maintenance allocation chart. The symbol designations for the various maintenance levels are as follows:

| | |
|---------|------------------------------|
| C | Operator or crew. |
| O | Organizational maintenance. |
| F | Direct support maintenance. |
| H | General support maintenance. |
| D | Depot maintenance. |

e. Column 5, Tools and Equipments. Column 5 specifies by code, those common tool sets (not individual tools) and special tools, test, and support equipment required to perform the designated function.

f. Column 6, Remarks. Column 6 contains letter codes in alphabetic order which are keyed to the remarks contained in Section IV.

D-4. Column Entries Used in Tool and Test Equipment Requirements

a. Column 1, Tool or Test Equipment Reference Code. The tool and test equipment reference code correlates with a maintenance function on the identified end item or component.

b. Column 2, Maintenance Level. The lowest level of maintenance authorized to use the tool or test equipment.

c. Column 3, Nomenclature. Name or identification of the tool or test equipment.

d. Column 4, National/NATO Stock Number. The National or NATO stock number of the tool or test equipment.

e. Column 5, Tool Number. The manufacturer's part number.

D-5. Explanation of Columns in Section IV

a. Reference Code. The code scheme recorded in column 1, Section III.

b. Remarks. This column lists information pertinent to the maintenance function being performed as indicated on the MAC, Section II.

SECTION II MAINTENANCE ALLOCATION CHART
FOR
RADIO TERMINAL SET AN/TRC-117(V)

| (1) GROUP NUMBER | (2) COMPONENT ASSEMBLY | (3) MAINTENANCE FUNCTION | (4) MAINTENANCE CATEGORY | | | | | (5) TOOLS AND EQPT. | (6) REMARKS |
|------------------------|--|--|-----------------------------|---|------------------------------------|-------------|--------------|--|---------------------|
| | | | C | O | F | H | D | | |
| 00 | RADIO TERMINAL SET AN/TRC-117(V); SC-B-545771 | Inspect Test Test Service Adjust Repair Repair Overhaul | | 0.5 1.0 1.0 1.5 2.0 | 3.0 3.0 | | | 1,2 1 thru 6 2 1,2 1,2 1 thru 6 1 thru 8 | A B C |
| 01 | SHELTER, ELECTRICAL EQUIPMENT S-330(*)/TRC-117; SC-B-547577 | Repair Repair Repair | | 2.0 | 4.0 | 8.0 | 40.0 | 2 1 thru 6 1 thru 8 | C D E |
| 0101 | REEL, CABLE RC-436(*)/U | Repair | | | 0.9 | | | 2 | |
| 0102 | CABLE ASSEMBLY, TELEPHONE CX-456(*)/G | Replace Repair | | 0.2 | 0.4 | | | 2 1,2 | |
| 0103 | CABLE ASSEMBLY, TELEPHONE CX-4760(*)/U | Replace Repair | | 0.2 | 0.4 | | | 2 1,2 | |
| 0104 | CABLE ASSEMBLY, POWER, ELECTRICAL CX-7453(*)/U | Replace Repair | | 0.2 | 0.4 | | | 2 1,2 | |
| 0105 | HEATER ASSEMBLY. DL-SC-B-539644 | Repair | | 0.4 | | | | 1,2 | |
| 0106 | CABLE ASSEMBLY, RADIO FREQUENCY CG-1040B/U | Replace Repair | | 0.2 | 0.4 | | | 2 1,2 | |
| 0107 | BOX CONTROL OVERVOLTAGE PROTECTOR ASSEMBLY SC-DL-532399 GR II | Repair | | 0.4 | | | | 1,2 | |
| 0108 | CABLE ASSEMBLY, POWER, ELECTRICAL SC-C-547174 GR I | Replace Repair | | 0.2 | 0.4 | | | 2 1,2 | |
| 0109 | CABLE ASSEMBLY, POWER, ELECTRICAL SC-C-547175 GR I | Replace Repair | | 0.2 | 0.4 | | | 2 1,2 | |
| 0110 | BLOWER ASSEMBLY; SC-D-539556-1 | Repair | | | 0.4 | | | 1,2 | F |
| 0111 | BLOWER ASSEMBLY; SC-D-539556-2 | Repair | | | 0.4 | | | 1,2 | F |
| 0112 | CABLE ASSEMBLY, POWER, ELECTRICAL CX-7705(*)/U | Replace Repair | | 0.2 | 0.4 | | | 2 1,2 | |
| 0113 | CABLE ASSEMBLY, TELEPHONE CX-1200/U | Replace Repair | | 0.2 | 0.4 | | | 2 1,2 | |
| 0114 | CABLE ASSEMBLY, TELEPHONE CX-1201/U | Replace Repair | | 0.2 | 0.4 | | | 2 1,2 | |
| 0115 | CABLE ASSEMBLY, SPECIAL PURPOSE, ELECTRICAL CX-7874/TCC | Replace Repair | | 0.2 | 0.4 | | | 2 1,2 | |
| 0116 | CABLE ASSEMBLY, SPECIAL PURPOSE, ELECTRICAL CX-7870/TCC | Replace Repair | | 0.2 | 0.4 | | | 2 1,2 | |
| 0117 | CABLE ASSEMBLY, POWER, ELECTRICAL CX-11173B/U | Replace Repair | | 0.2 | 0.4 | | | 2 1,2 | |
| 0118 | UTILITIES INSTALLATION, ELECTRICAL SC-D-547579 FOR S-330(A) AND SC-D-585105 FOR S-330(B) | Repair Repair | | 0.2 | 1.0 | | | 2 1 thru 6 | C |
| 011801 | CABLE ASSEMBLY, SPECIAL PURPOSE, ELECTRICAL CX-7875/TCC | Replace Repair | | 0.2 | 0.4 | | | 2 1,2 | |
| 011802 | CABLE ASSEMBLY, SPECIAL PURPOSE, ELECTRICAL CX-7876/TCC | Replace Repair | | 0.2 | 0.4 | | | 2 1,2 | |
| 011803 | CABLE ASSEMBLY, SPECIAL PURPOSE, ELECTRICAL CX-7872/TCC (10 FT., 0 IN.) | Replace Repair | | 0.2 | 0.4 | | | 2 1,2 | |
| 011804 | CABLE ASSEMBLY, SPECIAL PURPOSE, ELECTRICAL CX-7872/TCC (22 FT., 0 IN.) | Replace Repair | | 0.2 | 0.4 | | | 2 1,2 | |

SECTION II MAINTENANCE ALLOCATION CHART
FOR
RADIO TERMINAL SET AN/TRC-117(V)

| 1 GROUP NUMBER | 2 COMPONENT ASSEMBLY | 3 MAINTENANCE FUNCTION | 4 MAINTENANCE CATEGORY | | | | | 5 TOOLS AND EQUIP. | 6 REMARKS |
|----------------------|---|------------------------------|---------------------------|-----|-----|---|---|-----------------------------|--------------|
| | | | C | O | F | H | D | | |
| 011805 | CABLE ASSEMBLY, ANTENNA; SC-C-547183 GR II | Replace Repair | | 0.2 | 0.4 | | | 2 1,2 | |
| 011806 | CABLE ASSEMBLY, ANTENNA; SC-C-547183 GR IV | Replace Repair | | 0.2 | 0.4 | | | 2 1,2 | |
| 011807 | CABLE ASSEMBLY, ANTENNA; SC-C-547183 GR V | Replace Repair | | 0.2 | 0.4 | | | 2 1,2 | |
| 011808 | CABLE ASSEMBLY, VIDEO SYSTEM 2 SC-C-547221 GR V | Replace Repair | | 0.2 | 0.4 | | | 2 1,2 | |
| 011809 | CABLE ASSEMBLY, VIDEO SYSTEM 1 SC-C-547221 GR XVI | Replace Repair | | 0.2 | 0.4 | | | 2 1,2 | |
| 011810 | CABLE ASSEMBLY, RADIO FREQUENCY CG-409H/U (23 FT., 0 IN.) | Replace Repair | | 0.2 | 0.4 | | | 2 1,2 | |
| 011811 | CABLE ASSEMBLY, RADIO FREQUENCY CG-409H/U (22 FT., 0 IN.) | Replace Repair | | 0.2 | 0.4 | | | 2 1,2 | |
| 011812 | CABLE ASSEMBLY, RADIO FREQUENCY CG-409H/U (21 FT., 0 IN.) | Replace Repair | | 0.2 | 0.4 | | | 2 1,2 | |
| 011813 | CABLE ASSEMBLY, RADIO FREQUENCY CG-409H/U (20 FT., 0 IN.) | Replace Repair | | 0.2 | 0.4 | | | 2 1,2 | |
| 011814 | CABLE ASSEMBLY, SPECIAL PURPOSE, ELECTRICAL SC-D-547770-1 | Replace Repair | | 0.2 | 0.4 | | | 2 1,2 | |
| 011815 | CABLE ASSEMBLY, SPECIAL PURPOSE, ELECTRICAL SC-D-547770-2 | Replace Repair | | 0.2 | 0.4 | | | 2 1,2 | |
| 011816 | CABLE ASSEMBLY, SPECIAL PURPOSE, ELECTRICAL SC-D-547771-1 | Replace Repair | | 0.2 | 0.4 | | | 2 1,2 | |
| 011817 | CABLE ASSEMBLY, SPECIAL PURPOSE, ELECTRICAL SC-D-547771-2 | Replace Repair | | 0.2 | 0.4 | | | 2 1,2 | |
| 011818 | CABLE ASSEMBLY, SPECIAL PURPOSE, ELECTRICAL SC-D-547771-3 | Replace Repair | | 0.2 | 0.4 | | | 2 1,2 | |
| 011819 | CABLE ASSEMBLY, SPECIAL PURPOSE, ELECTRICAL SC-D-547772-1 | Replace Repair | | 0.2 | 0.4 | | | 2 1,2 | |
| 011820 | VIDEO AND ANTENNA ENTRANCE SC-B-547132 | Repair | | 0.3 | | | | 1,2 | |
| 011821 | POWER AND SIGNAL ENTRANCE SC-D-539621 | Repair | | 0.3 | | | | 1,2 | |
| 011822 | UTILITIES INSTALLATION RACEWAY SC-D-547594 FOR S-330(A), AND SC-D-585106 FOR S-330(B) | Repair Repair | | 0.4 | 0.6 | | | 1,2 1 thru 5 | |
| 01182201 | POWER DISTRIBUTION BOX ASSEMBLY SC-D-547602 OR SC-D-182927 | Repair | | 0.2 | | | | 1,2 | |
| 01182202 | SHELTER, MODIFIED SC-D-585108 | Repair | | | 0.4 | | | 1 thru 5 | |
| 0118220201 | SHELTER, ELECTRICAL EQUIPMENT SC-D-547578 FOR S-330(A), OR SC-D-585103 FOR S-330(B) | | | | | | | | G |
| 01182203 | PATCH PANEL SC-D-585137 | Repair | | | 0.3 | | | 1 thru 5 | H |
| 02 | CABLE ASSEMBLY, POWER, ELECTRICAL CX-4558(*)/U | Replace Repair | | 0.2 | 0.4 | | | 2 1,2 | |
| 03 | CABLE ASSEMBLY, RADIO FREQUENCY CG-718(*)/U (3 FT., 0 IN.) | Replace Repair | | 0.2 | 0.4 | | | 2 1,2 | |
| 04 | CABLE ASSEMBLY, RADIO FREQUENCY CG-718(*)/U (6 FT., 0 IN.) | Replace Repair | | 0.2 | 0.4 | | | 2 1,2 | |
| 05 | CABLE ASSEMBLY, RADIO FREQUENCY CG-1859(*)/U (40 FT., 0 IN.) | Replace Repair | | 0.2 | 0.4 | | | 2 1,2 | |
| 06 | CABLE ASSEMBLY, RADIO FREQUENCY CG-1859(*)/U (80 FT., 0 IN.) | Replace Repair | | 0.2 | 0.4 | | | 2 1,2 | |

SECTION II MAINTENANCE ALLOCATION CHART
FOR
RADIO TERMINAL SET AN/TRC-117(V)

| (1) GROUP NUMBER | (2) COMPONENT/ASSEMBLY | (3) MAINTENANCE FUNCTION | (4) MAINTENANCE CATEGORY | | | | | (5) TOOLS AND EQPT. | (6) REMARKS |
|------------------------|--|--------------------------------|-----------------------------|-----|---|---|---|------------------------------|----------------|
| | | | C | O | F | H | D | | |
| 07 | CONVERTER, TELEPHONE SIGNAL CV-1548/G | Replace | | 0.1 | | | | 2 | I |
| 08 | INTERCOMMUNICATION STATION LS-147C/FI | Replace | | 0.1 | | | | 2 | J |
| 09 | MULTIPLEXER TD-202/U | Replace | | 0.1 | | | | 2 | K |
| 10 | MULTIPLEXER TD-204/U | Replace | | 0.1 | | | | 2 | K |
| 11 | MULTIPLEXER TD-352/U | Replace | | 0.1 | | | | 2 | K |
| 12 | RADIO SET AN/GRC-50(V) | Replace | | 0.1 | | | | 2 | L |
| 13 | TELEPHONE SET TA-312/PT | Replace | | 0.1 | | | | 2 | M |
| 14 | VOLTAGE REGULATOR CN-514/GRC | Replace | | 0.1 | | | | 2 | N |
| 15 | COMMUNICATIONS SECURITY EQUIPMENT TSEC/KG-27 | | | | | | | | O |
| 1501 | INSTALLATION KIT TSEC/KG-27 | Repair | | 1.0 | | | | 1,2 | P |
| 1502 | LOOP-BACK TEST KIT TSEC/KG-27 | Repair | | 1.0 | | | | 1,2 | P |

SECTION III TOOL AND TEST EQUIPMENT REQUIREMENTS
FOR
TERMINAL SET, RADIO AN/TRC-117(V)

| TOOL OR TEST EQUIPMENT REF CODE | MAINTENANCE CATEGORY | NOMENCLATURE | NATIONAL NATO STOCK NUMBER | TOOL NUMBER |
|---------------------------------------|-------------------------|---|-------------------------------|-------------|
| 1 | O, F, H, & D | MULTIMETER AN/USM-223 | 6625-00-999-7465 | |
| 2 | O, F, H, & D | TOOL KIT, ELECTRONIC EQUIPMENT TK-101/G | 5810-00-064-5178 | |
| 3 | F, H, & D | MULTIMETER TS-352(*)/U | 6625-00-581-2036 | |
| 4 | F, H, & D | TOOL KIT, ELECTRONIC EQUIPMENT TK-100/G | 5180-00-605-0079 | |
| 5 | F, H, & D | TOOL KIT, ELECTRONIC EQUIPMENT TK-105/G | 5180-00-610-8177 | |
| 6 | F, H, & D | TOOL KIT, AUTOMOTIVE MECHANICS | 5180-00-754-0641 | |
| 7 | H & D | TOOL KIT, ELECTRONIC EQUIPMENT TK-144/G | 5180-00-973-4369 | |
| 8 | H & D | OHMMETER ZM-21A/U | 6625-00-246-5880 | |

SECTION IV. REMARKS

| REFERENCE CODE | REMARKS |
|-------------------|--|
| A | PERFORMANCE TESTING, BUILT-IN FACILITIES. |
| B | THE INDIVIDUAL COMPONENTS. |
| C | BY REPLACEMENT OF COMPONENTS. |
| D | EMERGENCY REPAIRS OF HOLES AND MINOR STRUCTURAL DAMAGE TO SHELTER FACILITY, REPLACEMENT OF THE DOOR HANDLE AND LATCH BOLT ASSEMBLIES, ENTRANCE DOOR FILTER, COVER ASSEMBLIES, AND GASKETS FOR THE BLOWER VENTS AND ENTRANCE BOXES. REFER TO TB SIG 354 FOR ADDITIONAL INFORMATION. |
| E | INCLUDES REPLACEMENT OF DOORS AND SKIDS, AND PERMANENT REPAIR OF HOLES AND MAJOR STRUCTURAL DAMAGE TO THE SHELTER. REFER TO TB SIG 354 FOR ADDITIONAL INFORMATION. ALSO INCLUDES REPLACEMENT OF THE 26 - PAIR RECEPTACLES AND CONNECTORS ON SIGNAL ENTRANCE. |
| F | BY REPLACEMENT OF AC POWER CORD, MOTOR, AND/OR IMPELLER. |
| G | SEE TM 11-5410-213-15P FOR MAINTENANCE ALLOCATION. |
| H | IN S-330(B) ONLY. |
| I | SEE TM 11-5805-367-12 FOR FURTHER MAINTENANCE ALLOCATION. |
| J | SEE TM 11-5830-221-12 FOR FURTHER MAINTENANCE ALLOCATION. |
| K | SEE TM 11-5805-367-12 FOR FURTHER MAINTENANCE ALLOCATION. |
| L | SEE TM 11-5820-461-12 FOR FURTHER MAINTENANCE ALLOCATION. |
| M | SEE TM 11-5805-201-12 FOR FURTHER MAINTENANCE ALLOCATION. |
| N | SEE TM 11-6110-245-15 FOR FURTHER MAINTENANCE ALLOCATION. |
| O | FOR MAINTENANCE ALLOCATION, REFER TO KAM-258(*)/TSEC (FOUO) AND TM 11-5810-232-12P. |
| P | REPAIR BY REPLACEMENT OF INDIVIDUAL DEFECTIVE CABLE OR COMPONENT. |

APPENDIX E

EXPENDABLE SUPPLIES AND MATERIALS LIST

Section I. INTRODUCTION

E-1. Scope

This appendix lists expendable supplies and materials you will need to operate and maintain the AN/TRC-117(*). These items are authorized to you by CTA 50-970, Expendable Items (Except Medical, Class V, Repair Parts, and Heraldic Items).

E-2. Explanation of Columns

a. Column 1—Item Number. This number is assigned to the entry in the listing and is referenced in the narrative instructions to identify the material (e.g., "Use cleaning compound, item 5, Appx D").

b. Column 2—Level. This column identifies the lowest level of maintenance that requires the listed item. (Enter as applicable.)

C—Operator/Crew

O—Organizational Maintenance

F—Direct Support Maintenance

H—General Support Maintenance

c. Column 3—National Stock Number. This is the National stock number assigned to the item; use it to request or requisition the item.

d. Column 4—Description. Indicates the Federal item name and, if required, a description to identify the item. The last line for each item indicates the part number followed by the Federal Supply Code for Manufacturer (FSCM) in parenthesis, if applicable.

e. Column 5—Unit of Measure (U/M). Indicates the measure used in performing the actual maintenance function. This measure is expressed by a two-character alphabetical abbreviation (e.g., ea, in, pr). If the unit of measures differs from the unit of issue, requisition the lowest unit of issue that will satisfy your requirements.

SECTION II EXPENDABLE SUPPLIES AND MATERIALS LIST

| (1) ITEM NO. | (2) LEVEL | (3) NATIONAL STOCK NUMBER | (4) DESCRIPTION PART NO. AND FSCM | 5 UNIT OF MEAS |
|--------------------|--------------|------------------------------------|--|-------------------------|
| | C | 8020-00-721-9657 | BRUSH, PAINT (MB-451) (81348) | EA |
| | C | 8305-00-222-2423 | CLOTH, LINT FREE (CCCC 660) (81348) | YARD |
| | C | 9150-00-985-7247 | GREASE, GRAPHITE AIRCRAFT (GGA) (MIL-G-23827) (81349) | QT |
| | C | 9150-00-068-9474 | OIL, LUBRICATING, ENGINE (OE-10) (81349) | QT |
| | C | 9150-00-027-8533 | OIL, LUBRICATING (PL-SPECIAL) | QT |
| | O | 8010-00-111-7937 | PAINT, RUST/CORROSION PROOF (TB-43-0118) | QT |
| | O | 8010-00-925-5084 | PAINT, SOLAR REFLECTIVE (MIL-E-46096) (TBSIG354) | CN |
| | C | 7510-00-281-5234 | PENCIL, NO. 1 (SS-P-116) (81348) | DOZ |
| | O | 5350-00-260-3485 | SANDPAPER, FINE (81348) | PKG |
| | O | 8010-00-160-5791 | THINNER, PAINT (T-354-L) (81348) | PINT |
| | C | 6850-00-105-3084 | TRICHLOROTRIFLUOROETHANE, TECHNICAL, CLEANING COMPOUND, FREON PCA, TYPE TF (81348) | PINT |
| | C | 5970-00-188-5477 | TAPE, INSULATION (80063) | ROLL |
| | C | 4020-00-241-8886 | TWINE (T-T-891) (81348) | BALL |

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| | | | |
|------|------|--|--|
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|------|------|--|--|

Recommend that the installation antenna alignment procedure be changed through to specify a 2° IFF antenna lag rather than 1°.

REASON: Experience has shown that with only a 1° lag, the antenna servo system is too sensitive to wind gusting in excess of 25 knots, and has a tendency to rapidly accelerate and decelerate as it hunts, causing strain to the drive train. Hunting is minimized by adjusting the lag to 2° without degradation of operation.

| | | | |
|------|-----|--|-----|
| 3-10 | 3-3 | | 3-1 |
|------|-----|--|-----|

Item 5, Function column. Change "2 db" to "3db."

REASON: The adjustment procedure for the TRANS POWER FAULT indicator calls for a 3 db (500 watts) adjustment to light the TRANS POWER FAULT indicator.

| | | | |
|-----|-----|--|--|
| 5-6 | 5-8 | | |
|-----|-----|--|--|

Add new step f.1 to read, "Replace cover plate removed in step e.1, above."

REASON: To replace the cover plate.

FO3

Zone C 3. On J1-2, change "+24 VDC to "+5 VDC."

REASON: This is the output line of the 5 VDC power supply. + 24 VDC is the input voltage.

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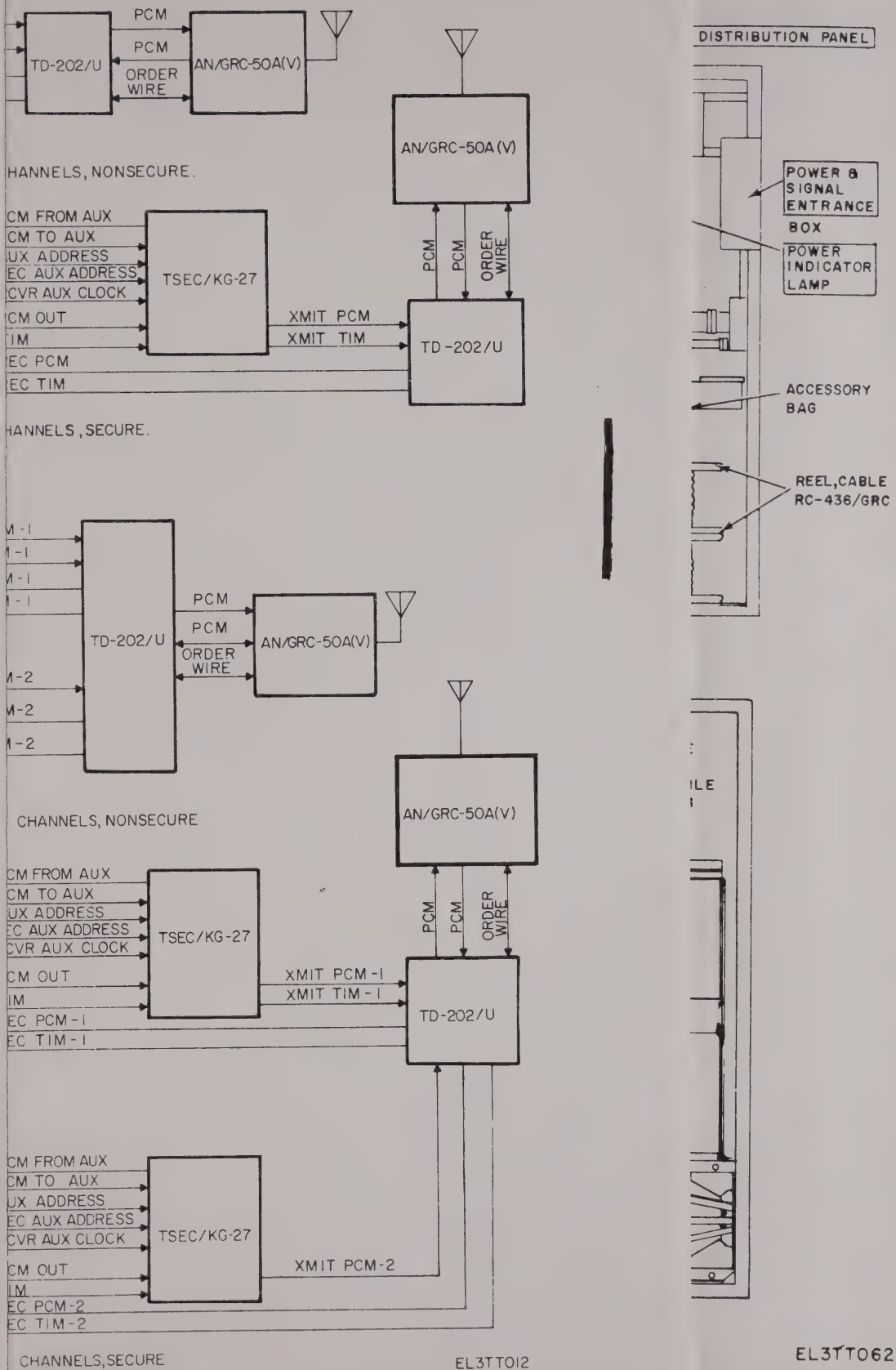


Figure 2-1. AN/TRC-117(*) radio terminal applications, block diagram.

an and elevation diagram.

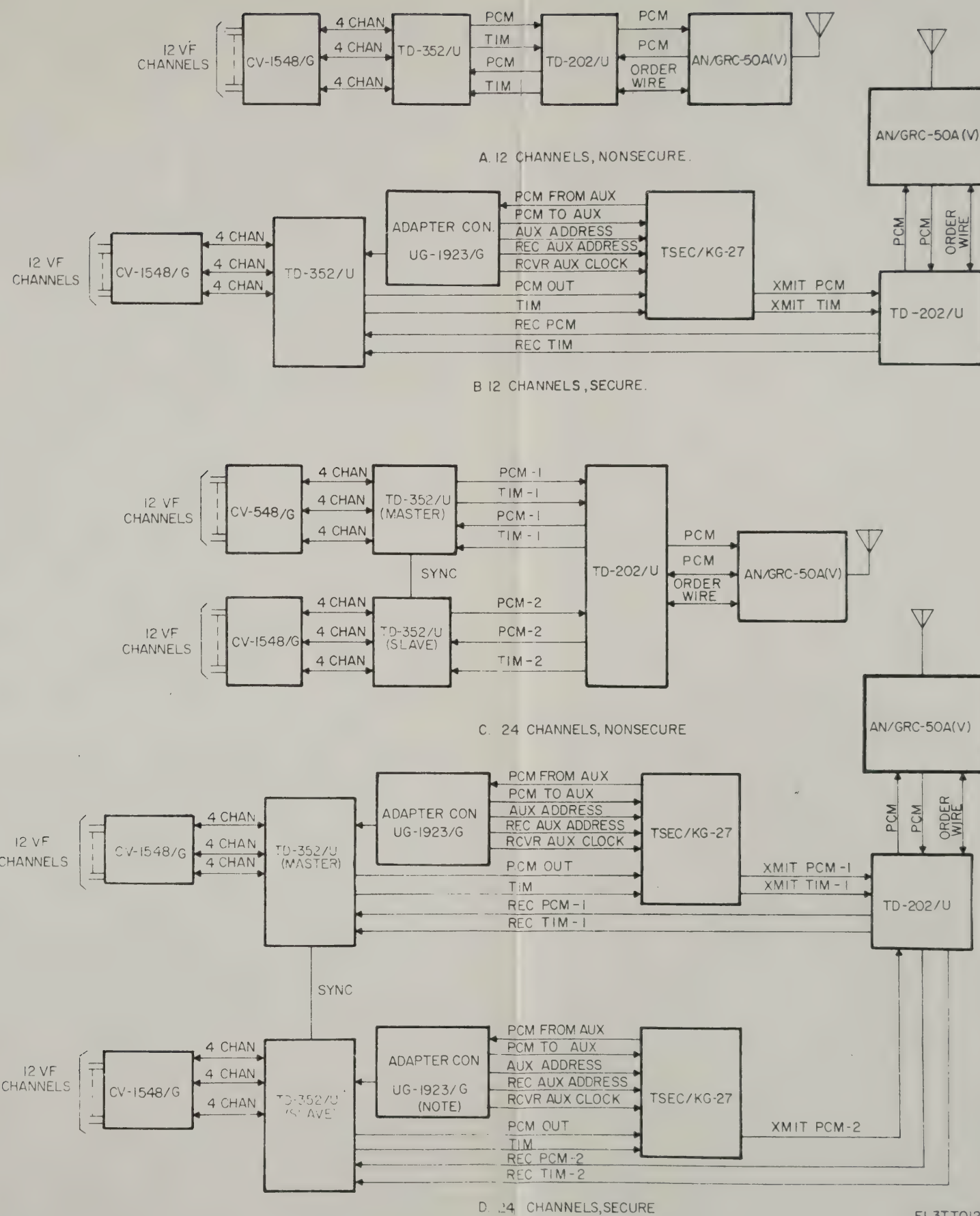
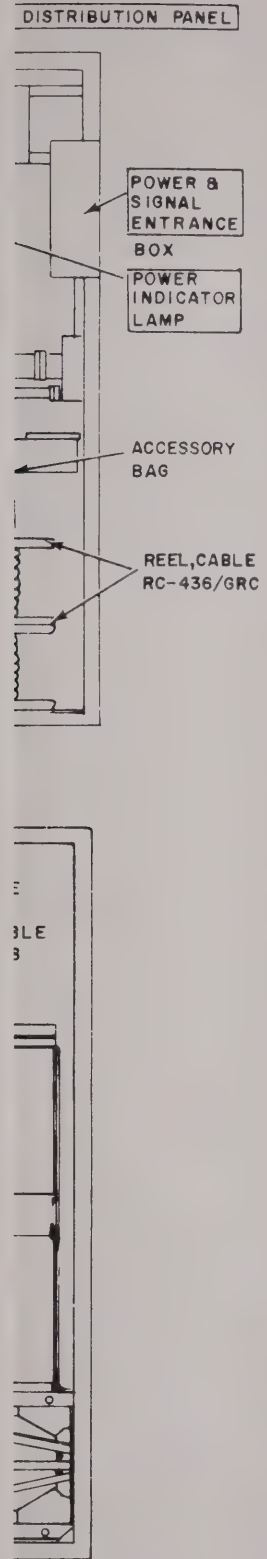
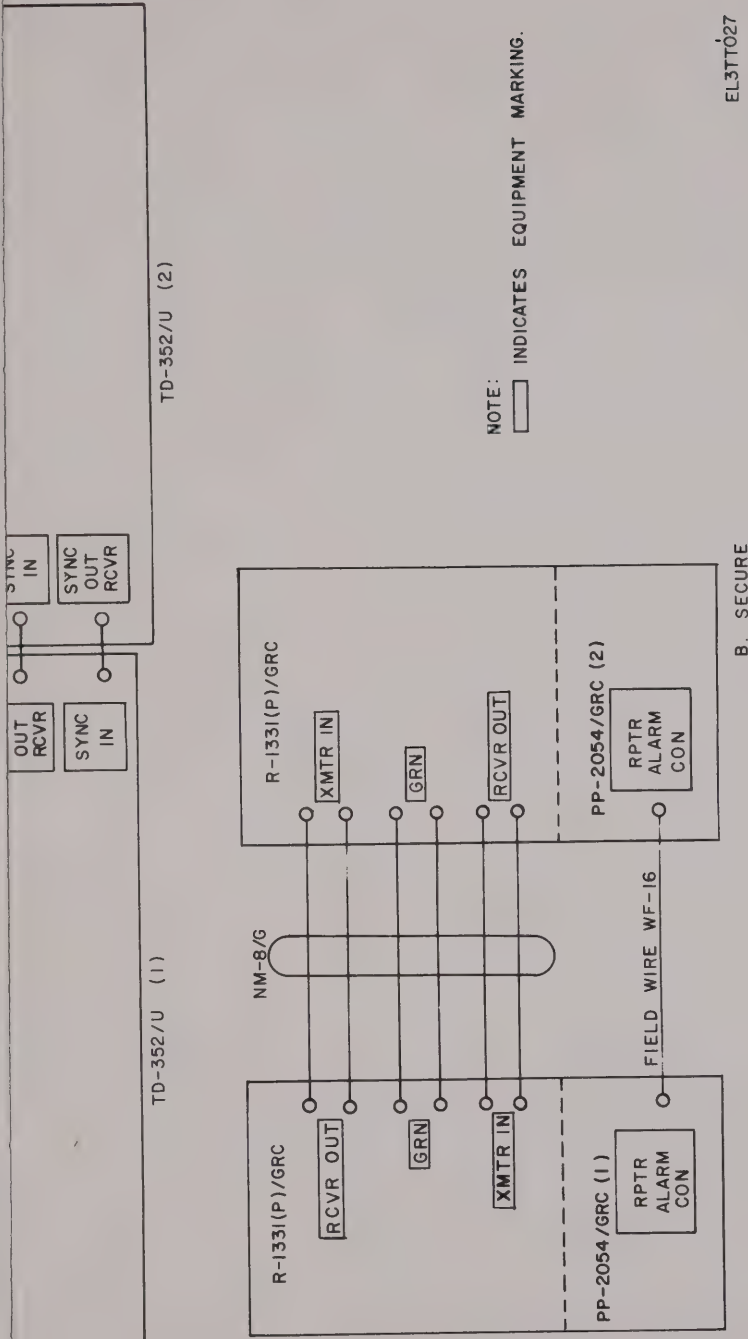
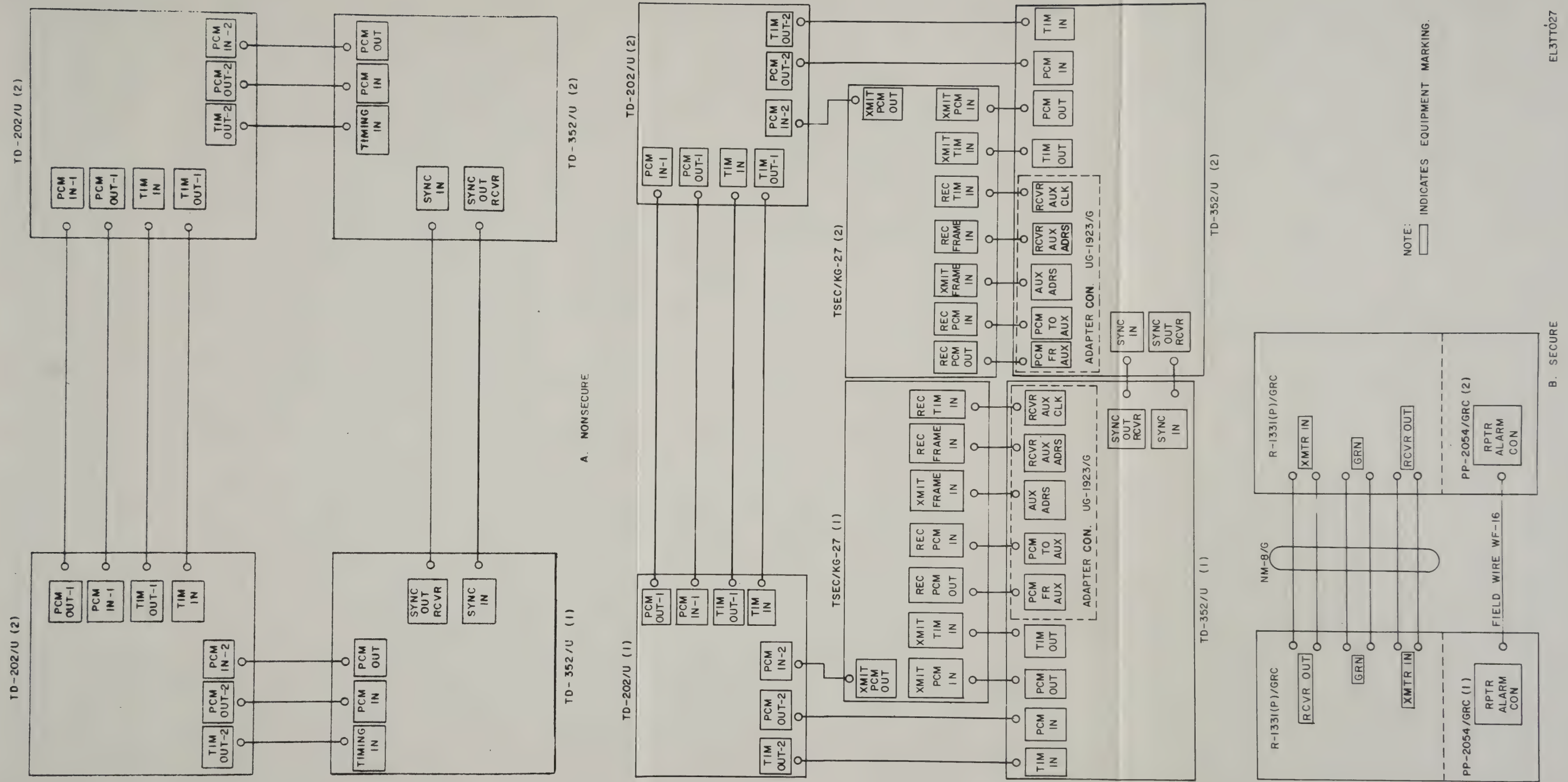
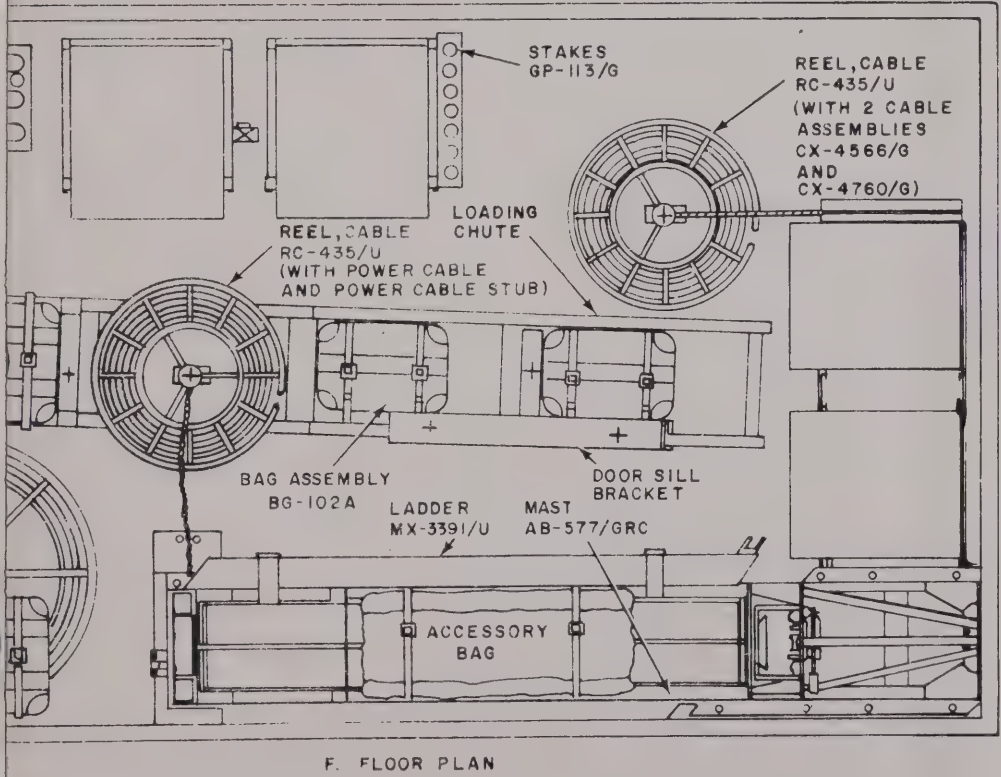
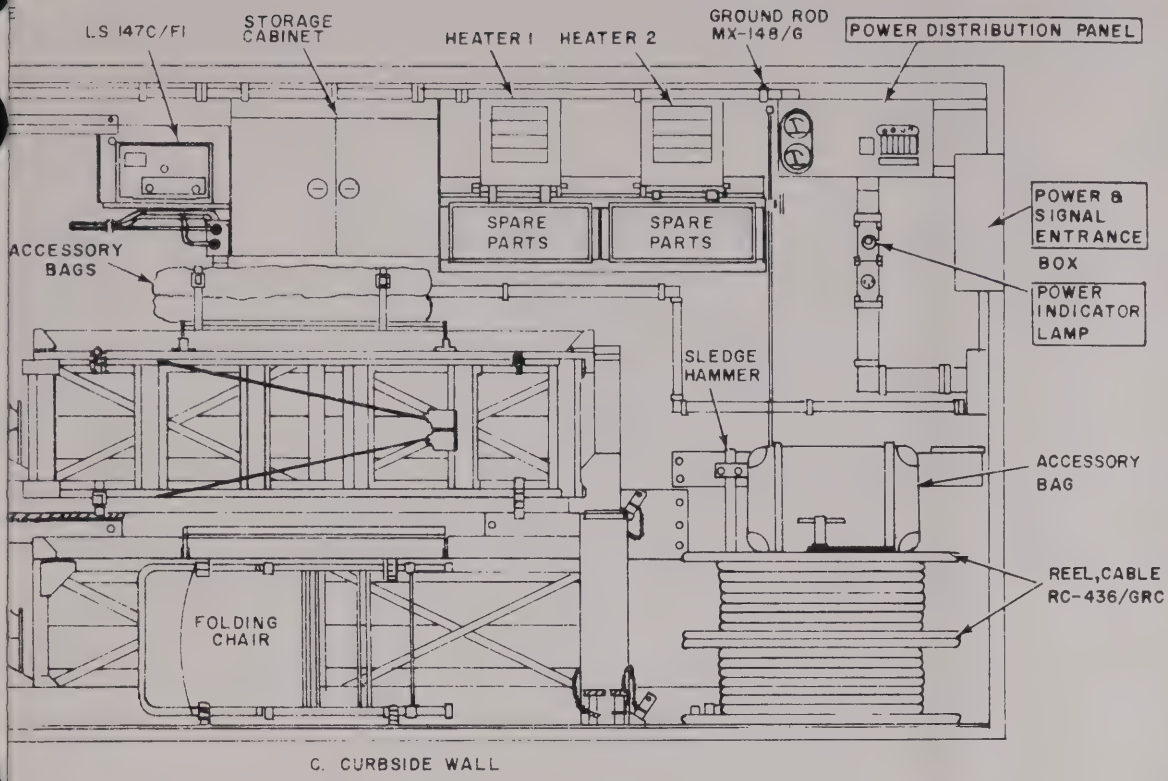


Figure 2-1. AN/TRC-117(*) radio terminal applications, block diagram.



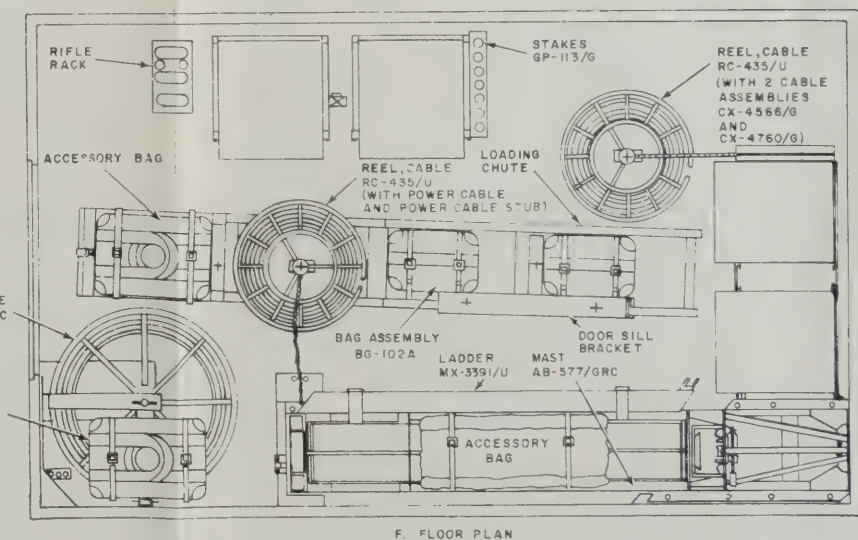
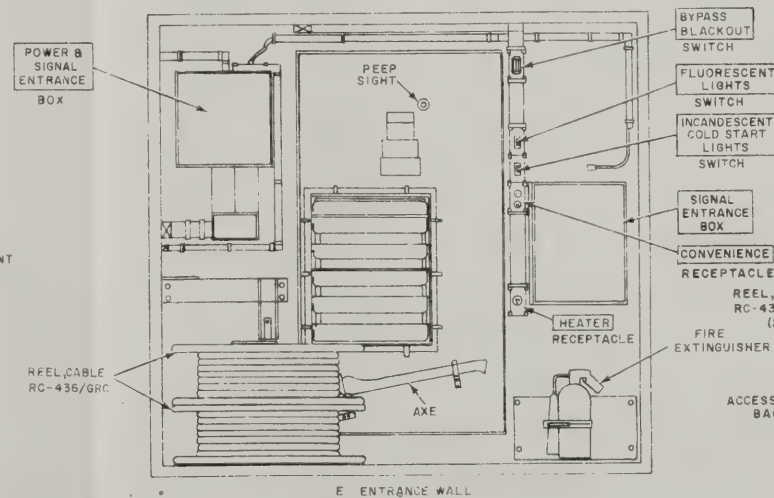
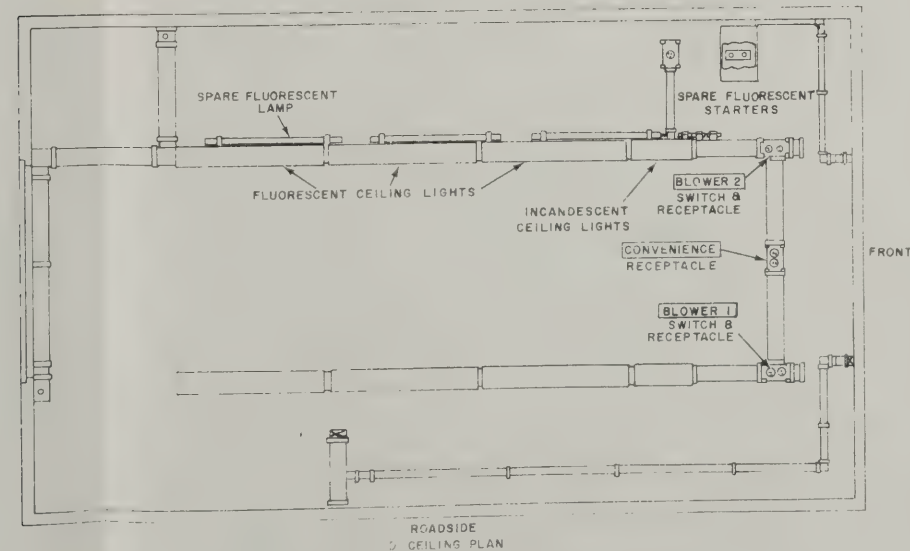
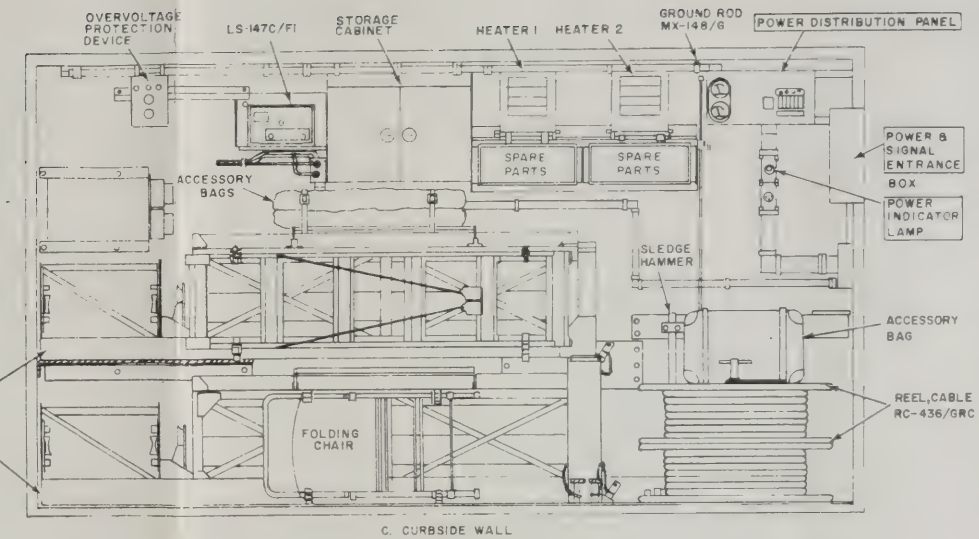
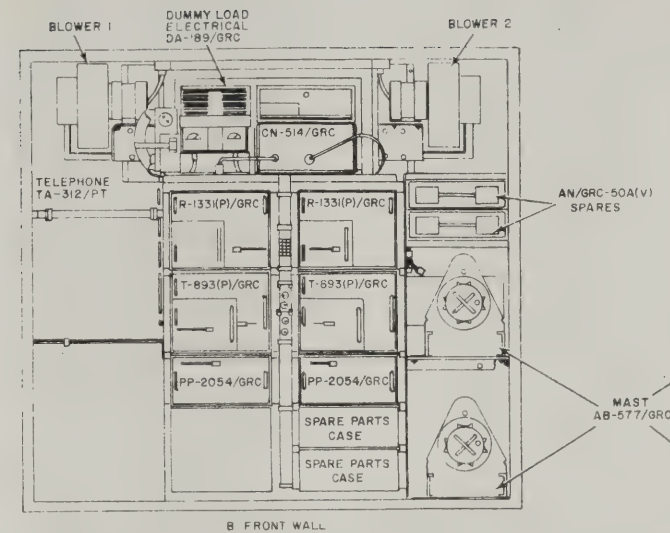
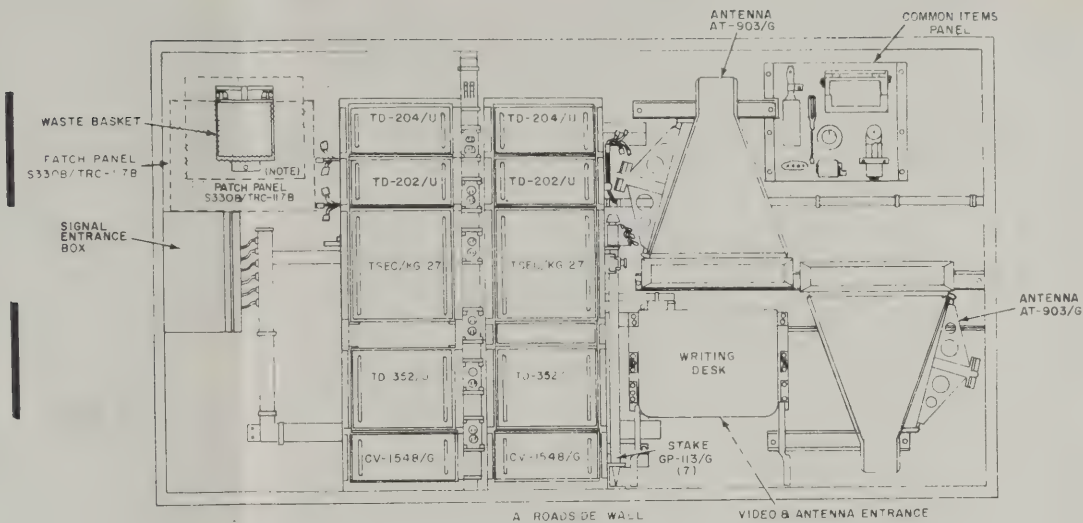
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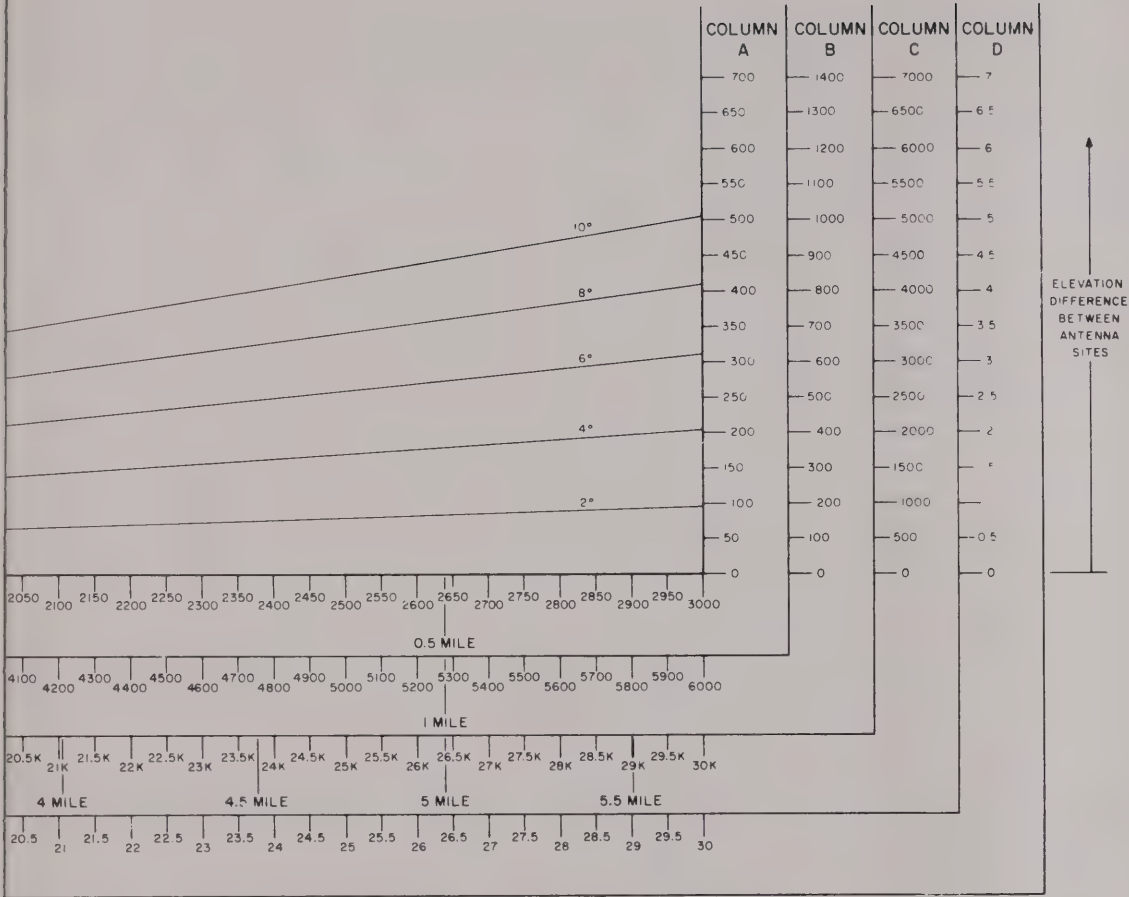


EL37T062

Figure FO 1. AN TRC-117, floor plan and elevation diagram.

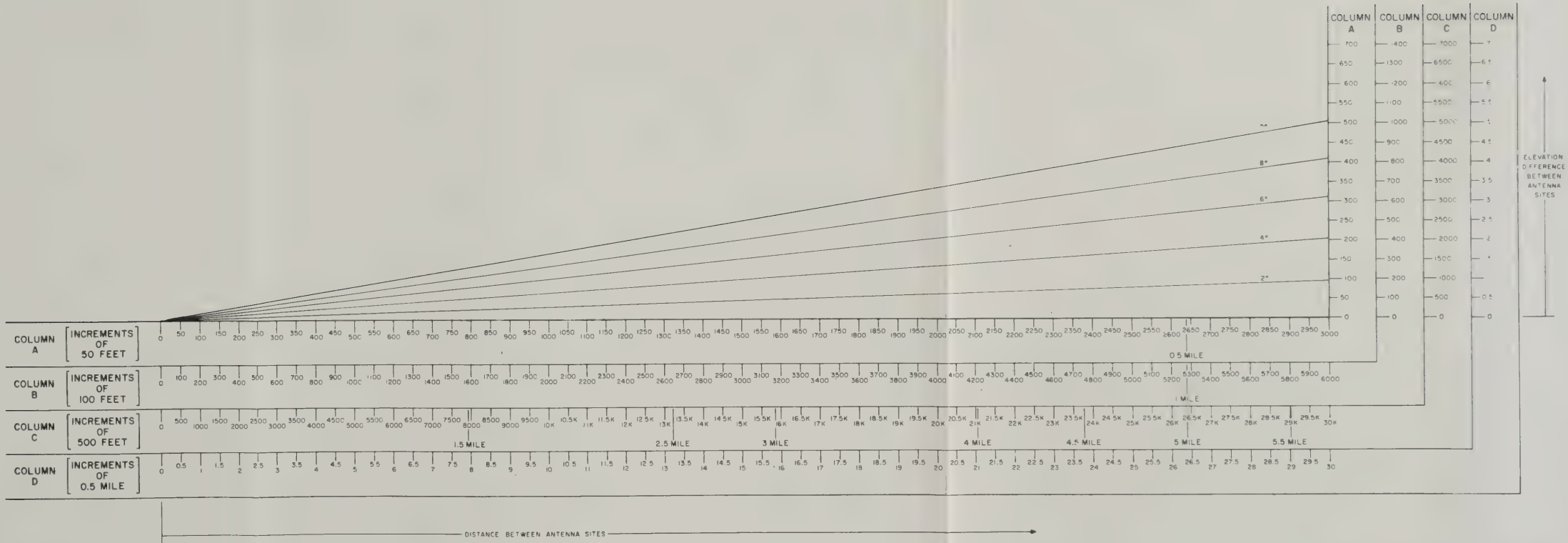


NOTE: LOCATION OF PATCH PANEL ON S330B/TRC-117 (V)



EL3TT063

Figure FO-2. Elevation angles for AT-903/G.



EL3TT063

Figure FO-2. Elevation angles for AT-903/G.

NOTES:

EQUIPMENT MARKING.

UNLESS OTHERWISE SPECIFIED.

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ED.

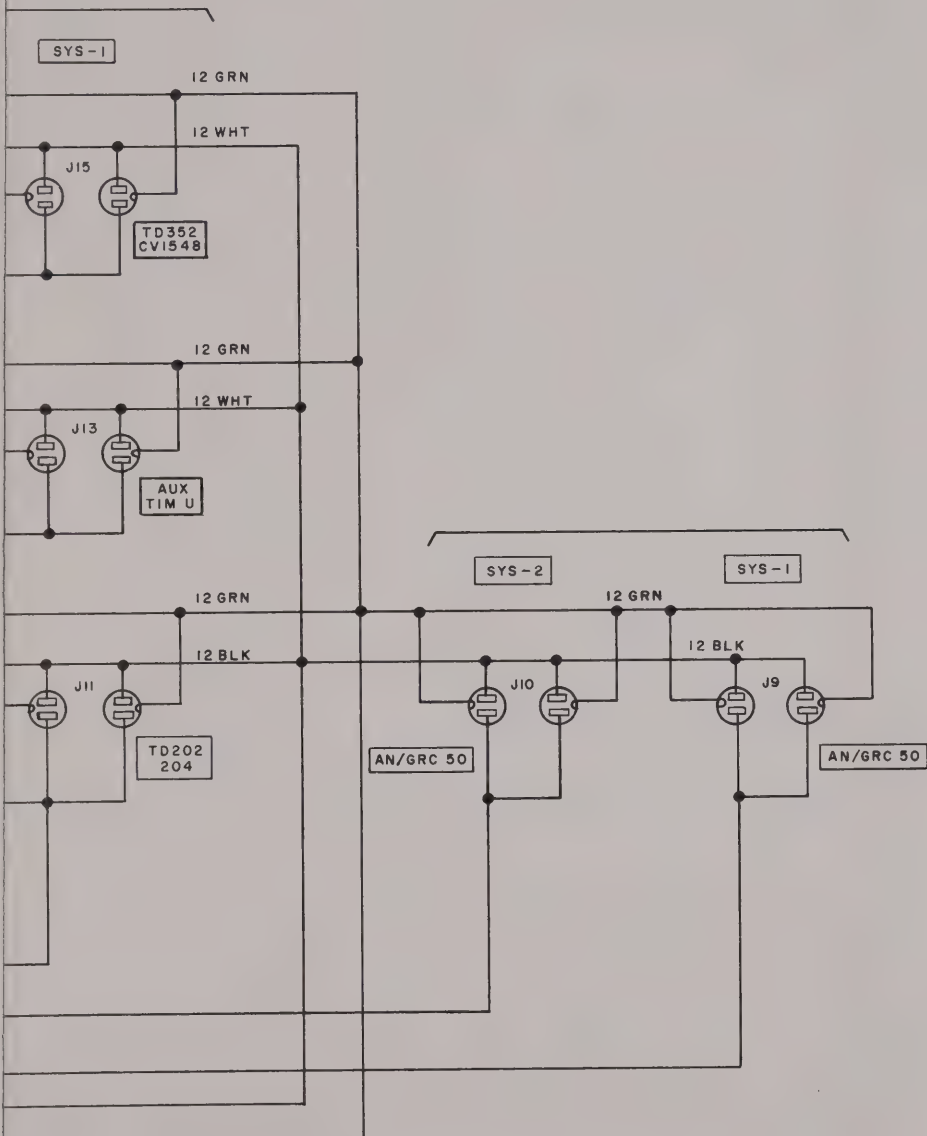
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P1, P3



P2, P4



EL3TT064

Figure FO-3. AN/TRC-117(*), ac power distribution, schematic-wiring diagram.

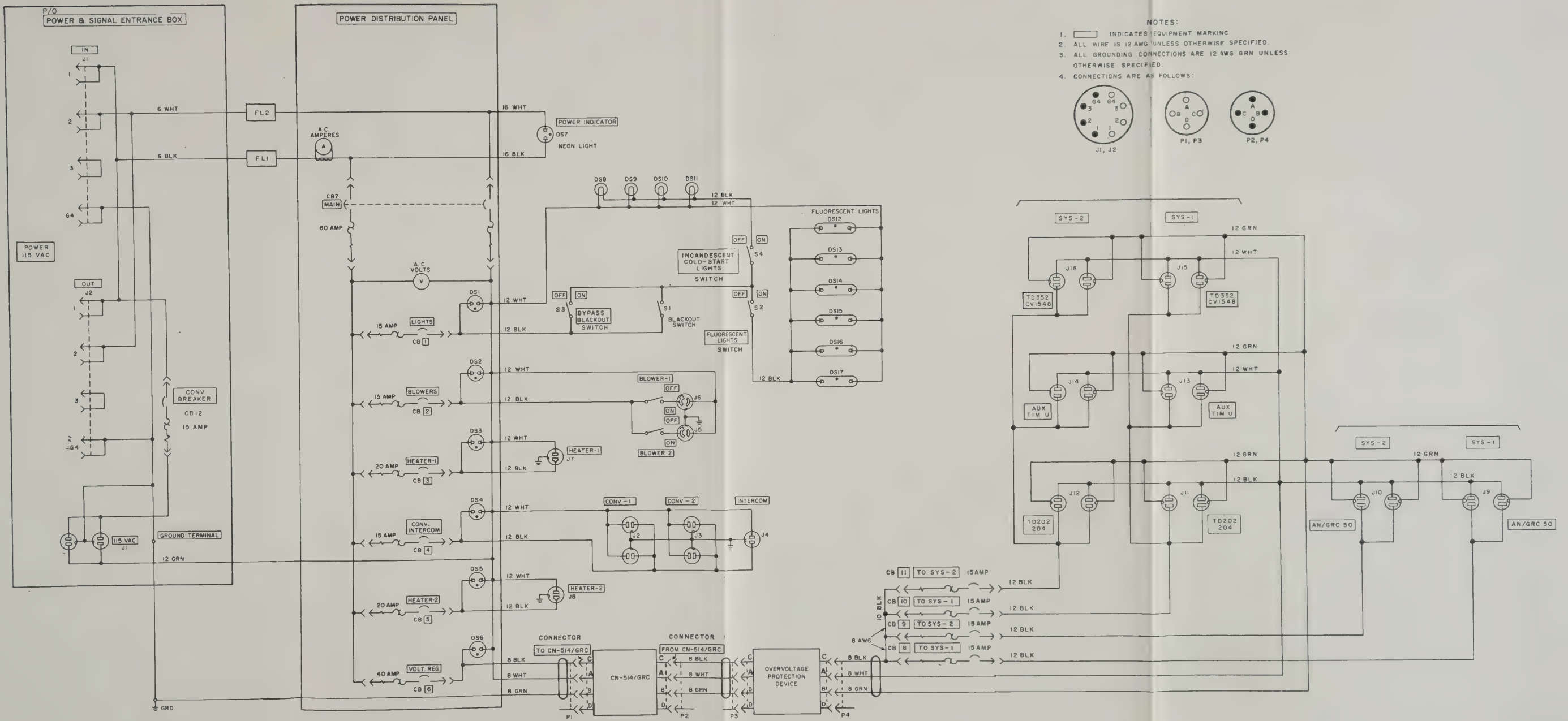
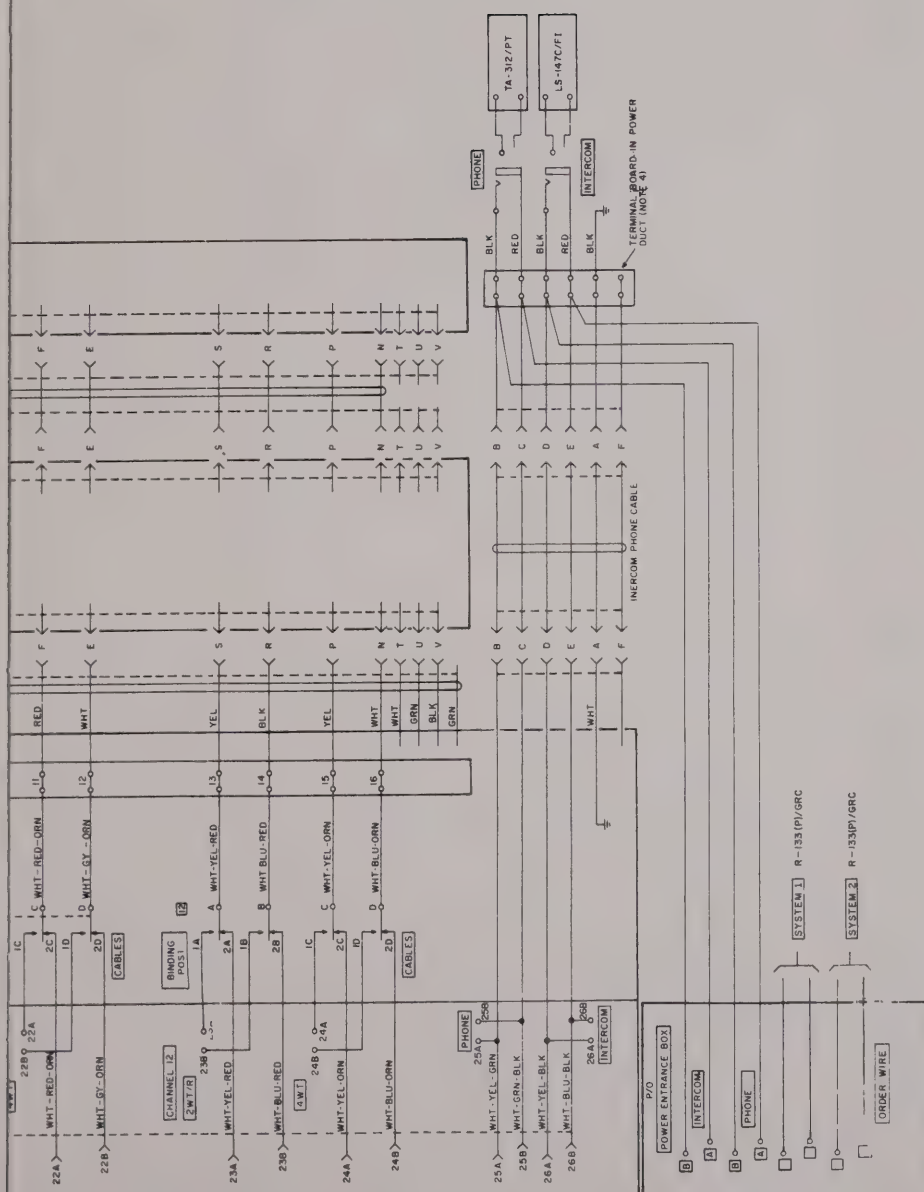
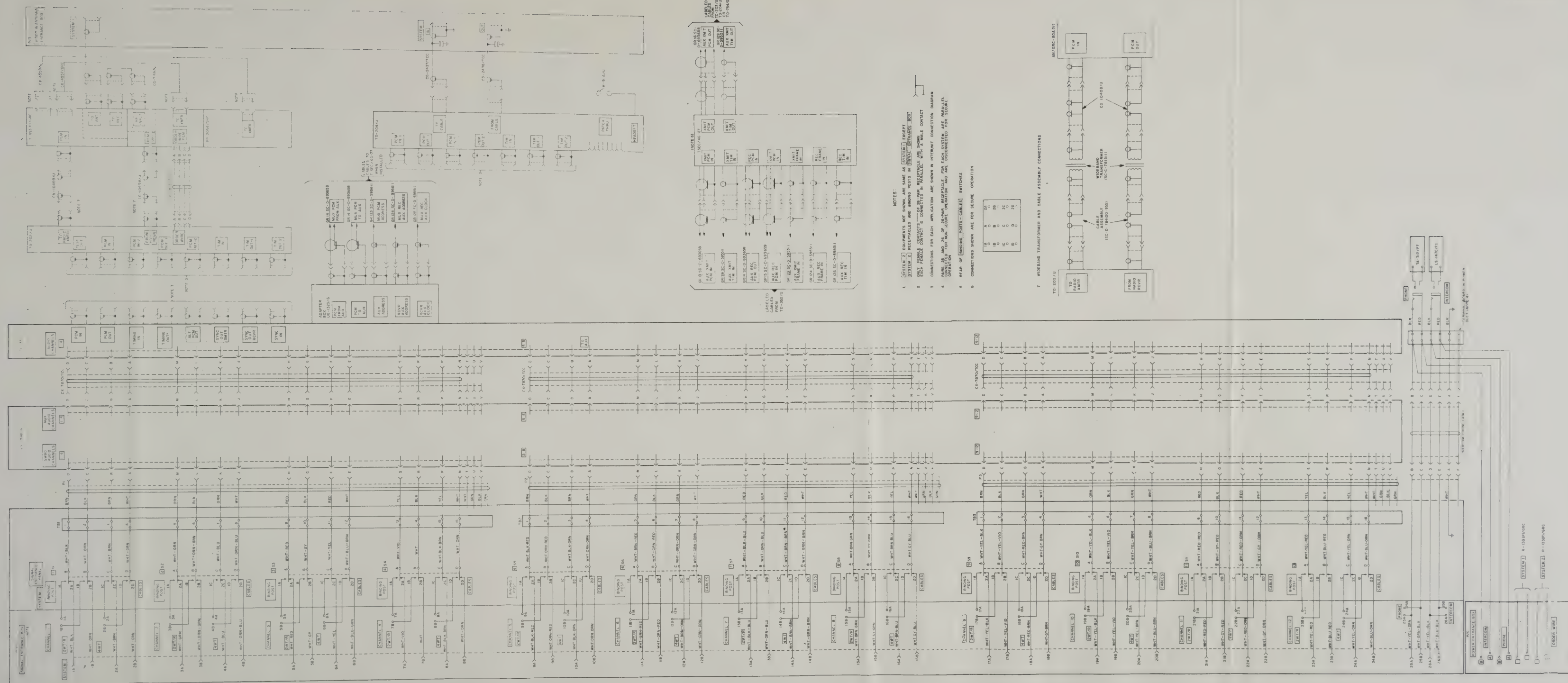
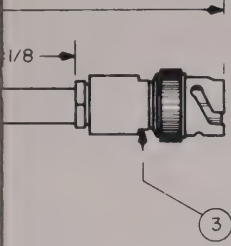


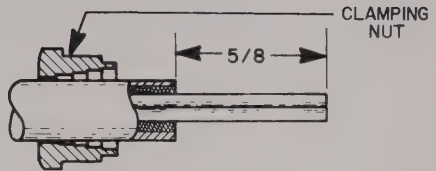
Figure FO-3. AN/TRC-117(*), ac power distribution, schematic-wiring diagram



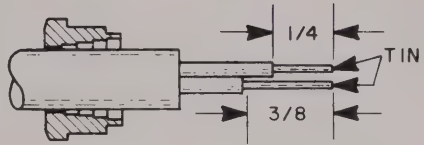




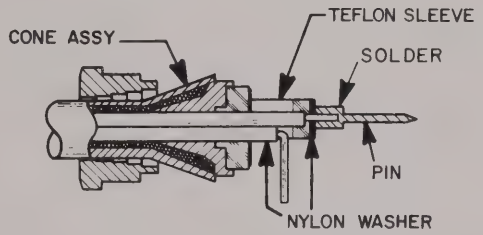
STEP 1



STEP 2



STEP 3

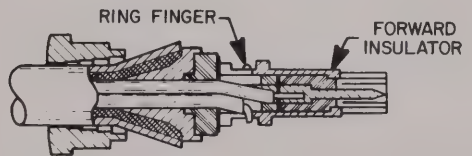


WS:

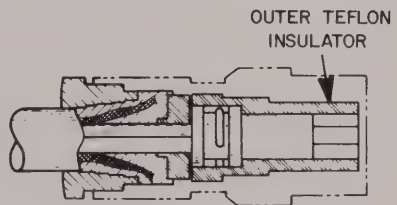
ER.

USED,

STEP 4

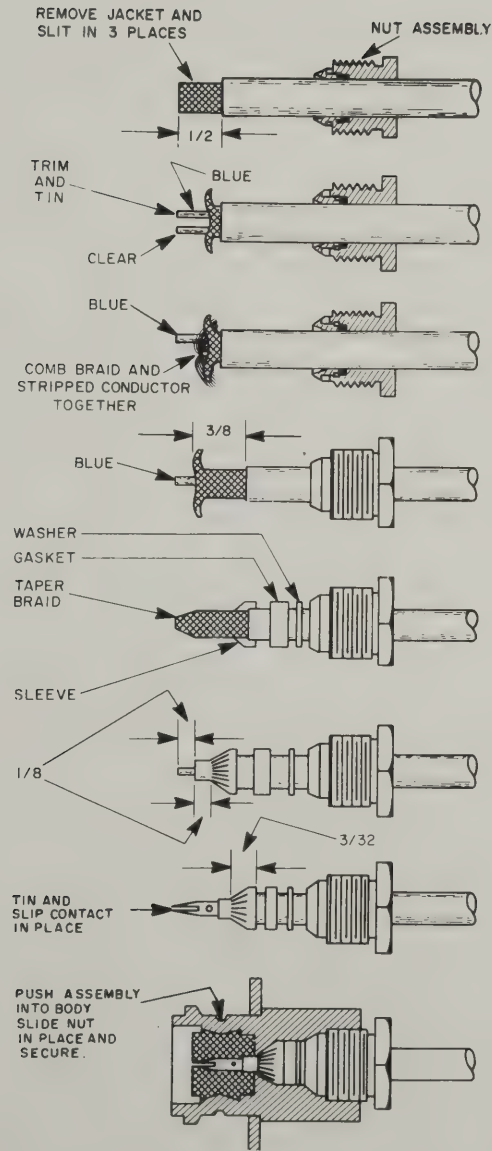


STEP 5



EL3TT066

Figure FO-5. Rfc cable assembly details.



STEP 1

STEP 2

STEP 3

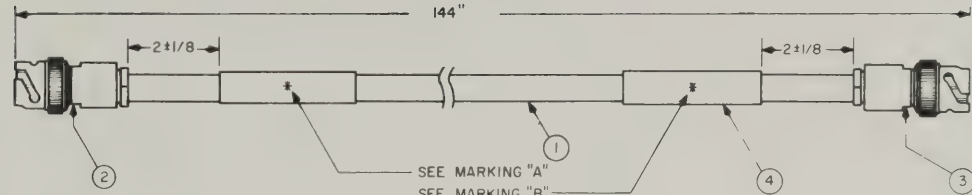
STEP 4

STEP 5

STEP 6

STEP 7

STEP 8



| ITEM NO | DESCRIPTION |
|---------|------------------------|
| 1 | CABLE TWINAX, TWC 78-2 |
| 2 | CONNECTOR UG-260D |
| 3 | CONNECTOR PL-75 |
| 4 | BAND IDENTIFICATION |



NOTES:

1. CABLE DRAWING DESIGNATION SC-D-693658 FOLLOWED BY GRI3, GRI4, GRI5, GRI6 AS FOLLOWS:
2. SOME CABLES MAY CONTAIN A CG-3473/U MARKING BAND INSTEAD OF THE SC-D NUMBER.
3. SOLDER SHALL BE COMPOSITION SN60 TYPE S OR RMA PER QQ-S-571 WHEN TYPE 'S' IS USED, FLUX PER SPEC MIL-F-14256 SHALL BE EMPLOYED.
4. SUGGESTED SOURCE TROMPETER ELECTRONICS INC. CHATSWORTH, CALIFORNIA, OR EQUAL.

| GROUP | MARKING "A" | MARKING "B" |
|-------|------------------|------------------|
| 13 | MUX PCM OUT | AUX XMIT PCM OUT |
| 14 | MUX PCM FROM AUX | AUX REC PCM OUT |
| 15 | MUX PCM TO AUX | AUX REC PCM IN |
| 16 | COMB/PCM IN | AUX XMIT PCM OUT |

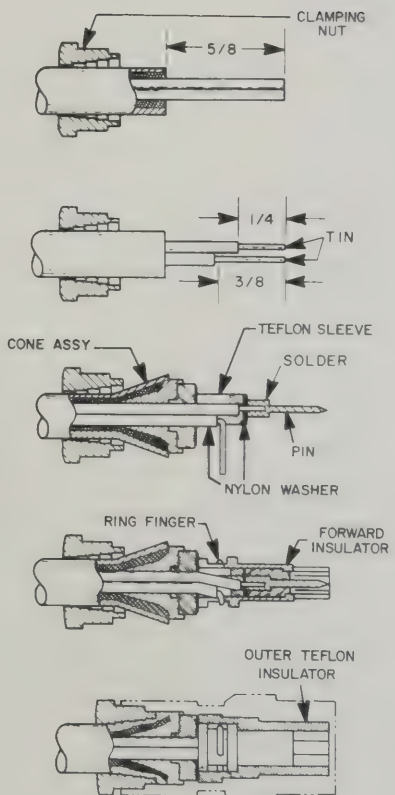
STEP 1

STEP 2

STEP 3

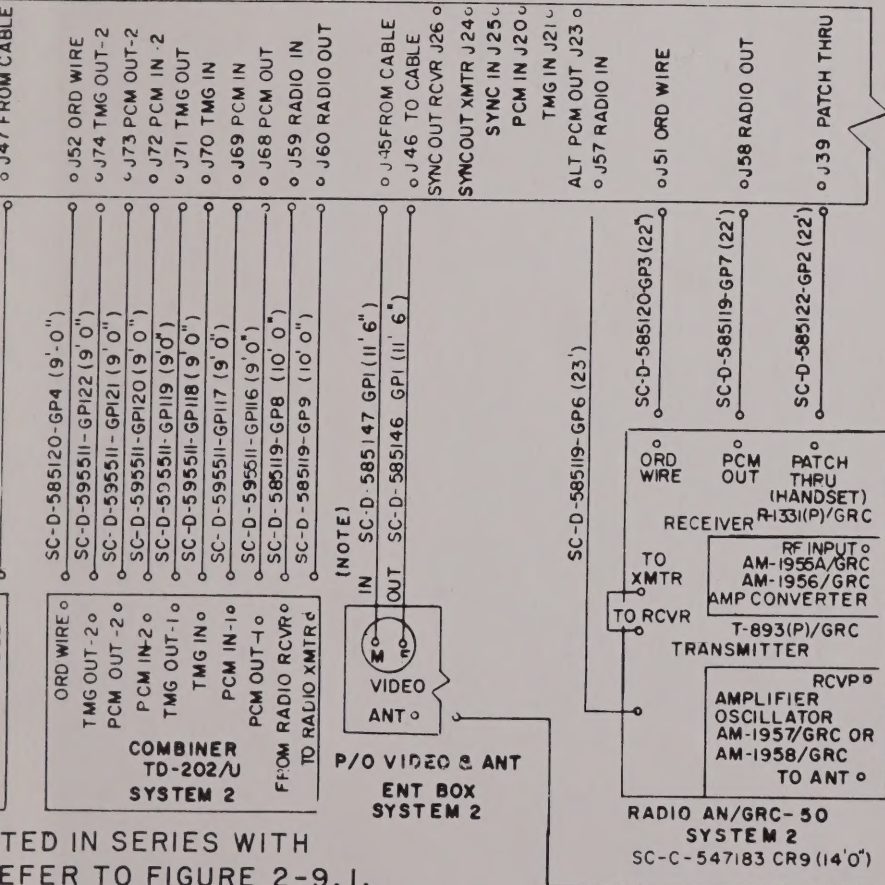
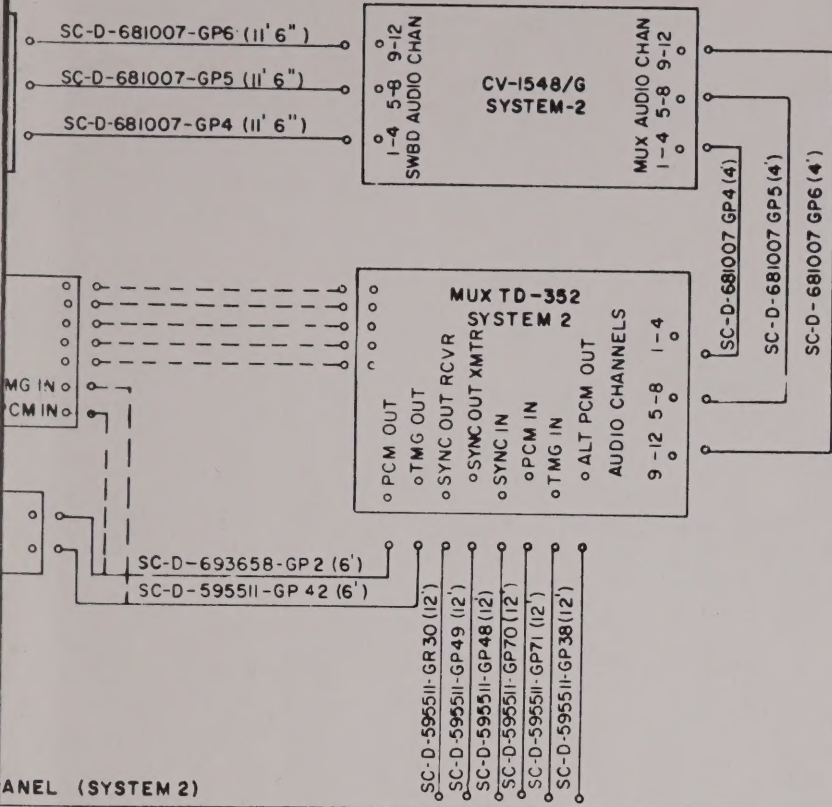
STEP 4

STEP 5



EL3TT066

Figure FO-5. Rf cable assembly details.



ATED IN SERIES WITH
REFER TO FIGURE 2-9.1.

| | | |
|----|------|------|
| 1 | 1000 | 1000 |
| 2 | 1000 | 1000 |
| 3 | 1000 | 1000 |
| 4 | 1000 | 1000 |
| 5 | 1000 | 1000 |
| 6 | 1000 | 1000 |
| 7 | 1000 | 1000 |
| 8 | 1000 | 1000 |
| 9 | 1000 | 1000 |
| 10 | 1000 | 1000 |

| | | |
|----|------|------|
| 1 | 1000 | 1000 |
| 2 | 1000 | 1000 |
| 3 | 1000 | 1000 |
| 4 | 1000 | 1000 |
| 5 | 1000 | 1000 |
| 6 | 1000 | 1000 |
| 7 | 1000 | 1000 |
| 8 | 1000 | 1000 |
| 9 | 1000 | 1000 |
| 10 | 1000 | 1000 |

| | | |
|----|------|------|
| 1 | 1000 | 1000 |
| 2 | 1000 | 1000 |
| 3 | 1000 | 1000 |
| 4 | 1000 | 1000 |
| 5 | 1000 | 1000 |
| 6 | 1000 | 1000 |
| 7 | 1000 | 1000 |
| 8 | 1000 | 1000 |
| 9 | 1000 | 1000 |
| 10 | 1000 | 1000 |

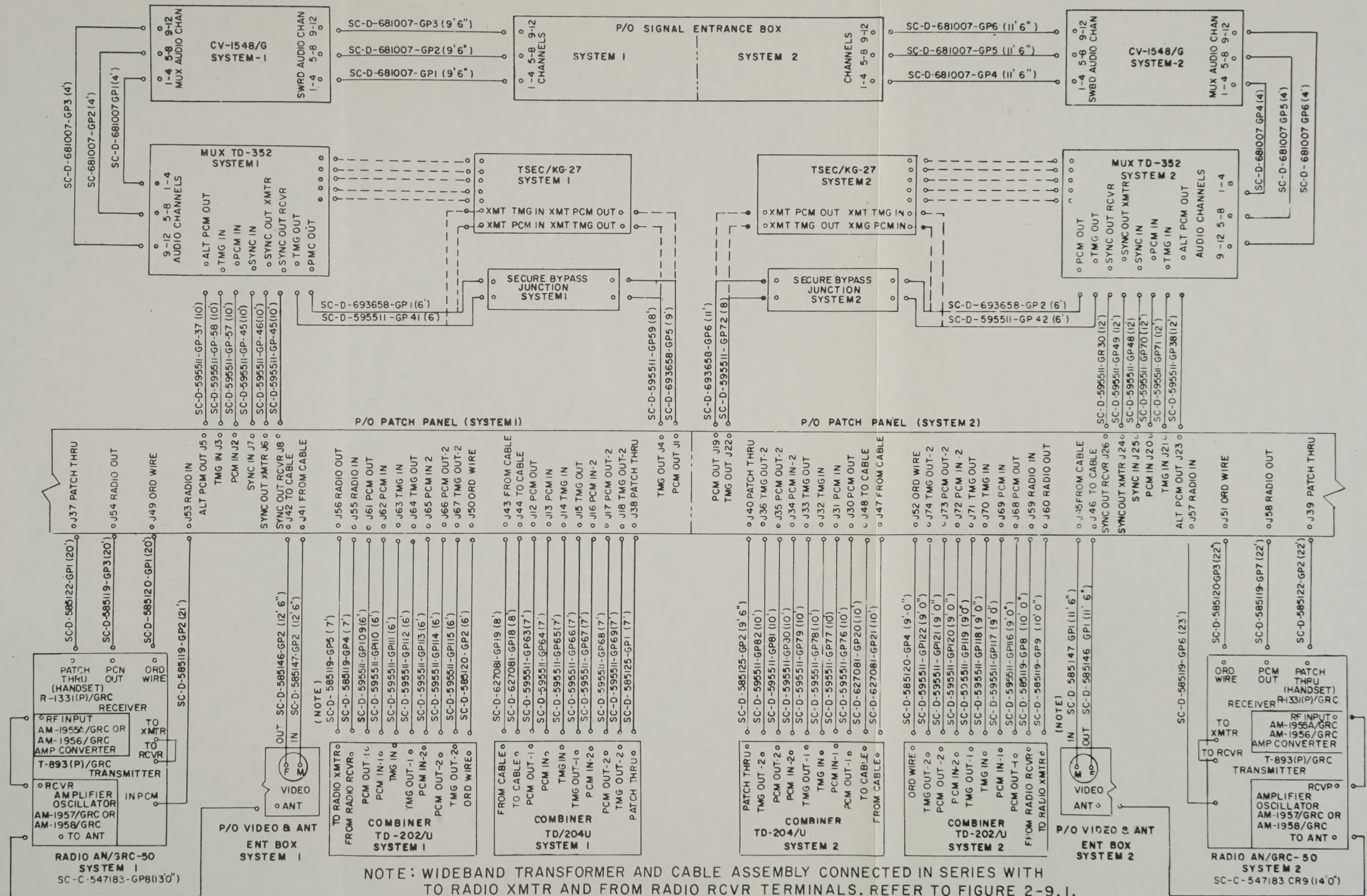
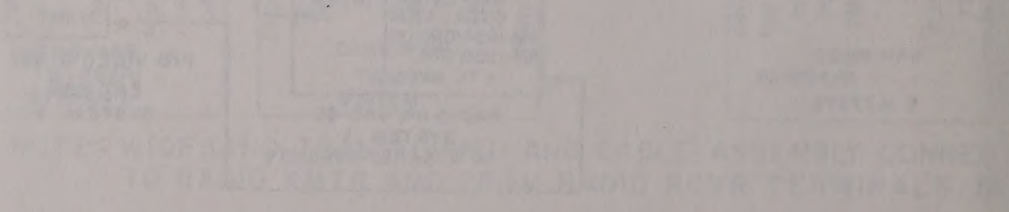
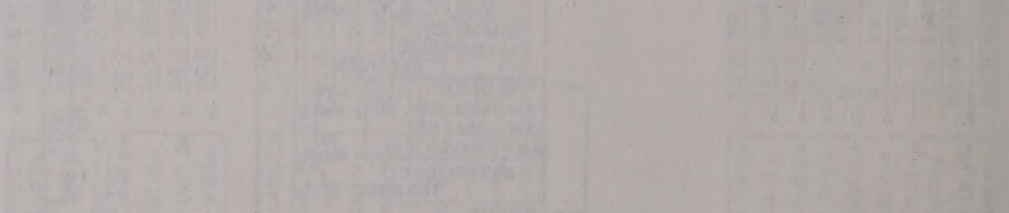
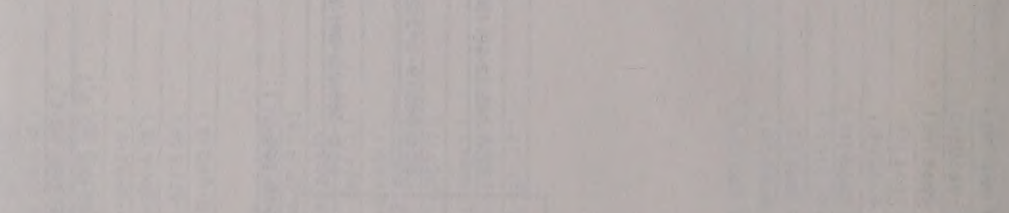
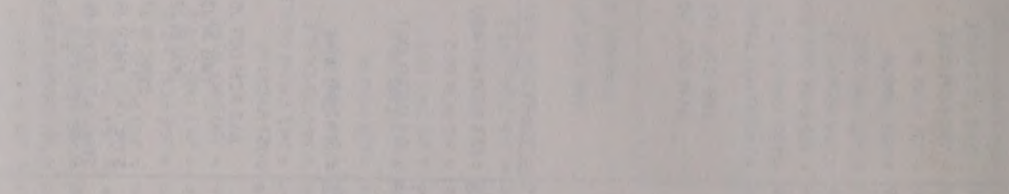
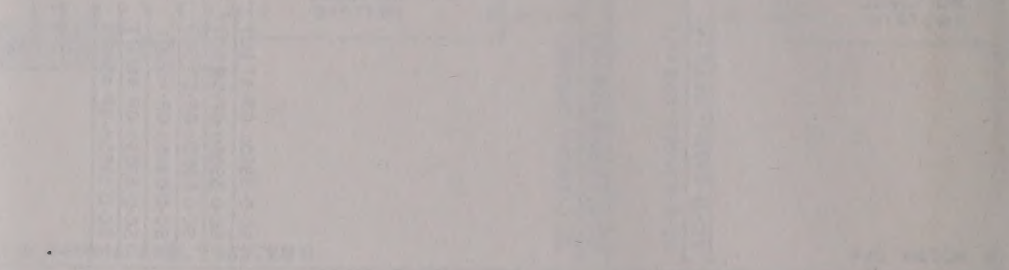
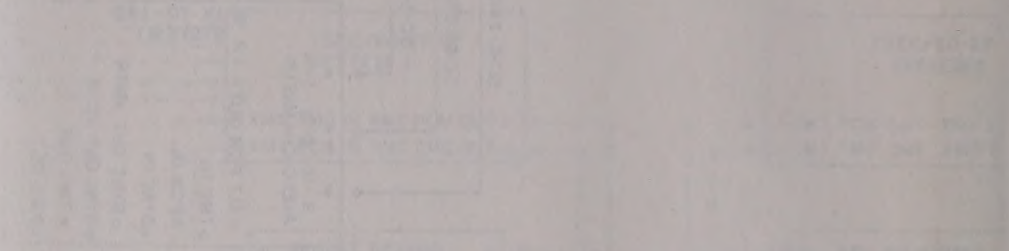
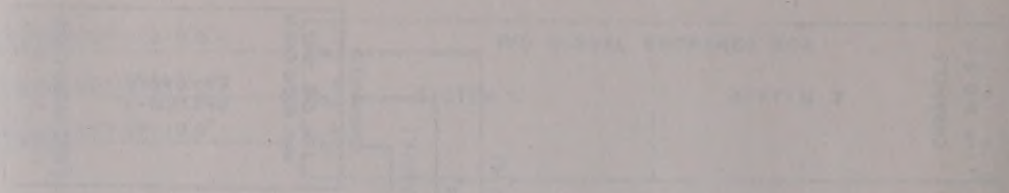


Figure FO-6. Radio Terminal Set AN/TRC-117(*), Signal Schematic Wiring Diagram, B Version.



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